

# CHAPTER 4

## Environmental Impacts and Mitigation





## 4 ENVIRONMENTAL IMPACTS AND MITIGATION

### 4.1 Introduction

This chapter discusses the environmental analysis and impacts associated with the proposed project. It comprises 13 sections, covering topics that include different aspects of the built environment (e.g., land use, noise, and vibration), the natural environment (e.g., ecosystems, water quality), historic and cultural resources, and commitment of resources.

Each section reviews the affected environment, analyzes potential environmental impacts that would result from the No-Build Alternative and the Build alternatives, and proposes mitigation and enhancement strategies to minimize negative environmental impacts. Each section analyzes long-term, short-term (construction), indirect (or secondary), and cumulative impacts.

The analysis of long-term impacts covers the permanent changes caused by the completed project. This includes the ferry terminal facilities and related improvements such as streets, sidewalks, and landscaping, and any mitigation measures developed as part of the project. The ongoing operation of the project is also considered.

The analysis of short-term or construction impacts covers the activities required to build the multimodal project, including all of the heavy construction activities and staging that would occur.

This Final EIS also considers the project's indirect (or secondary) impacts on the environment. As defined under 40 Code of Federal Regulations (CFR) Section 1508.8(b), indirect effects "are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

The analysis of cumulative impacts considers the overall changes to the environment over time, including past, present, or reasonably foreseeable future actions, and evaluates the added impacts of the proposed project.

### 4.2 Land Use and Economics

This section reviews the potential for impacts on land use and economic activities in the project area. In addition, it identifies the property requirements for each of the alternatives, including the potential acquisition of properties that are not already being used for transportation purposes, and the displacement or relocation of their uses.

#### 4.2.1 Overview of Analysis and Regulatory Context

The land use analysis discusses whether the proposed alternatives are compatible with local comprehensive plans, shoreline management programs, regional development plans, and the development regulations that implement the plans. It

also reviews long-term operations impacts and short-term construction impacts that could affect existing land uses.

The economic analysis focuses on how the development and operation of the multimodal facility would affect local and regional economic activities, either directly or indirectly.

#### **4.2.2 Affected Environment**

The Mukilteo Multimodal Project area is located on Elliot Point in the northernmost part of the city of Mukilteo, with a small part within the city of Everett.

Major land uses on Elliot Point include several large publicly owned properties as well as private properties to the north of the BNSF tracks and commercial and residential uses to the south (see Figure 1-2 in *Chapter 1 Purpose and Need*). The Mukilteo Lighthouse Park occupies the west end of the point. This 14-acre City of Mukilteo facility includes a boat launch and 6.6 acres of parking, as well as the historic Mukilteo Lighthouse, a volleyball court, and picnic tables. The Mukilteo ferry terminal covers about 2 acres, largely consisting of a vehicle holding area and a small area for employee parking.

A condominium development, a restaurant, and a hotel are located along the shoreline between the lighthouse and Park Avenue and occupy about 2 acres of land. Along Front Street, Ivar's restaurant is located east of SR 525; a commercial parking lot serving the restaurant is located east of the ferry holding area. A glass blowing studio is located on Park Avenue at First Street. These private uses occupy about 1.5 acres.

The Mukilteo Tank Farm is a 20-acre parcel extending about 3,200 feet along the shoreline, beginning on the east of Park Avenue and bounded on the south by the BNSF Railway corridor. The Mukilteo Tank Farm consists largely of partially demolished storage tanks and a variety of support facilities in various stages of deterioration, as well as a 1,300-foot-long pier. NOAA Fisheries currently operates the Mukilteo Research Station east of Park Avenue. The Mount Baker Terminal occupies a 1.5-acre site east of the Mukilteo Tank Farm.

The BNSF Railway owns a right-of-way at the edge of Elliot Point, which generally forms the boundary between flat land to the north and a steep bluff to the south. This rail line serves freight trains, Amtrak train service, and commuter passenger trains operated by Sound Transit. The Sound Transit Mukilteo Station is located on the north side of the BNSF tracks east of Park Avenue.

South of the BNSF tracks, land uses are primarily single-family residential west of SR 525 and east of Park Avenue. A commercial area extends between the BNSF tracks and Third Street, bounded by SR 525 on the west and Park Avenue on the east. The City of Mukilteo Rosehill Community Center is located on a 5-acre site at Third Street and Lincoln Avenue.

Other major land uses in the general area include the 1,300-acre Paine Field Municipal Airport located about 2 miles to the south, and the 1,025-acre Boeing Everett Facility about 2 miles south and a mile to the east. A commercial area extends along SR 525 between about 100th Street and 130th Street, approximately 3 miles to the south.

## State, Regional, and Local Plans and Policies

The proposed alternatives are located primarily within the City of Mukilteo's land use planning jurisdiction, with a small portion to the east within the Everett city limits. Land use is regulated and influenced by city plans and policies, as well as several state and regional plans and policies.

**Growth Management Act.** Washington State's Growth Management Act (GMA) (Revised Code of Washington [RCW] 36.70A) of 1990 requires state and local governments to manage statewide growth by identifying urban growth areas (UGAs) and preparing comprehensive plans, capital improvement programs, and development regulations. The GMA requires infrastructure (transportation, water, sewer, and other urban services) to achieve population and employment targets established by the regional and local comprehensive plans. The GMA also specifies that transportation projects be identified and constructed concurrent with future development projects.

"Essential public facilities" (EPFs) are defined in the GMA (RCW 36.70A.200) as including state or regional transportation facilities of statewide significance. Ferry terminals as well as high-capacity transit facilities have statewide significance. Cities and counties are required to include a process for identifying and siting essential public facilities. Local jurisdictions cannot have local comprehensive plan or development regulations that preclude EPFs, but they can impose permitting conditions and require reasonable mitigation of impacts. The City of Mukilteo *Comprehensive Plan*, as discussed below, reflects the intent of the GMA and includes policies related to EPFs.

**City of Mukilteo Comprehensive Plan.** Mukilteo's *Comprehensive Plan* was updated in 2012 and provides goals and policies to guide growth and development in the city (City of Mukilteo 2012). The *Comprehensive Plan* is a 20-year policy plan and, consistent with GMA requirements, includes land use, transportation, housing, capital facilities, utilities, economic development, and environmental elements.

The City's *Comprehensive Plan* envisions the waterfront as a visitor- or tourist-oriented activity center with restaurants, a marina, and recreational opportunities with extensive public access. The Plan designates the existing Mukilteo ferry terminal, the Mukilteo Tank Farm, and surrounding area as COM (Commercial). The zoning of the Mukilteo Tank Farm is WMU (Waterfront Mixed Use), permitting a range of public and commercial uses, with multi-family as a secondary use. The area of the existing ferry terminal, ferry holding area, and nearby commercial and condominium uses is zoned DB (Downtown Business), permitting public and commercial uses, with multi-family as an accessory use. The Mukilteo Lighthouse Park is designated and zoned as OS (Open Space), permitting a variety of recreation and public uses and a limited range of commercial uses. Figures 4.2-1 and 4.2-2 show the *Comprehensive Plan* and zoning designations for the project area. While the ferry terminal is part of the state highway system and is not subject to local zoning, WSDOT designed the project alternatives to support the *Comprehensive Plan* objectives as much as possible, and considered the Plan's underlying zoning designations in the site layouts. The state transportation plan includes the terminal relocation, and the City's *Comprehensive Plan* anticipates the terminal relocation, as described in more detail in the following sections.

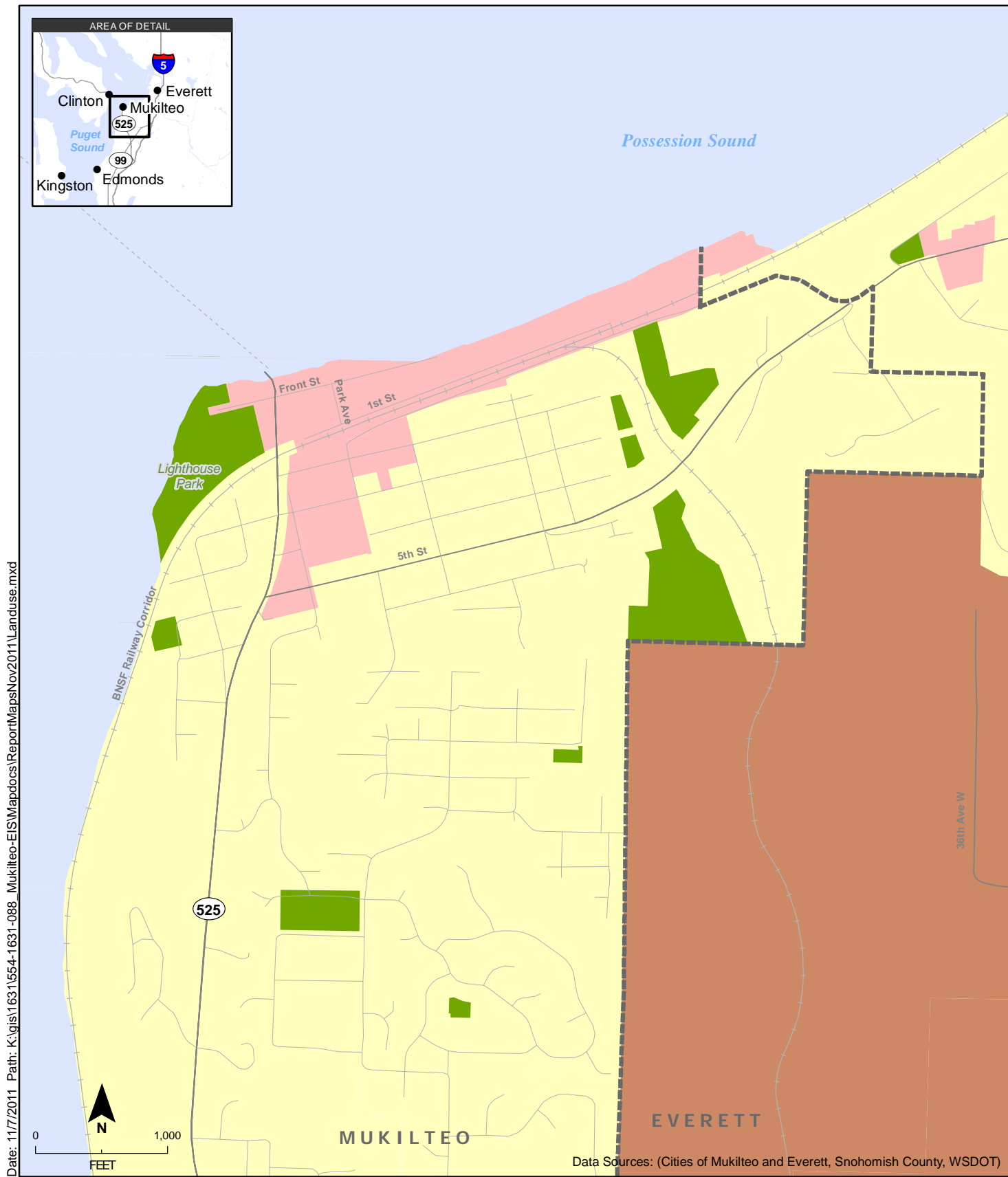
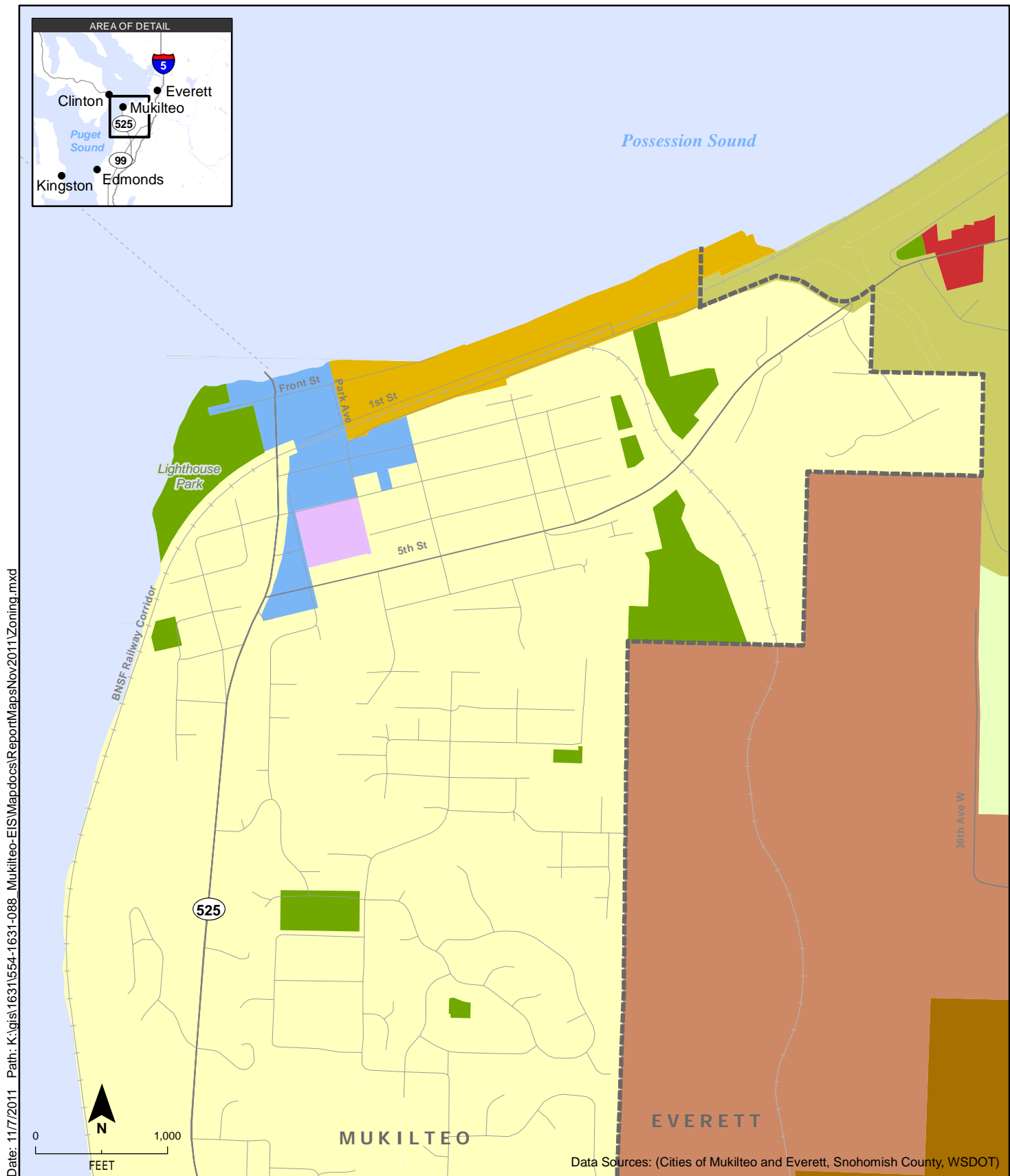


Figure 4.2-1. Comprehensive Plan Land Use



- |                           |                            |                      |
|---------------------------|----------------------------|----------------------|
| Single-family Residential | Downtown Business          | Park and Open Space  |
| Other Residential         | Business Park              | Public - Semi Public |
| Waterfront Mixed Use      | Office and Industrial Park | City Boundary        |
| Neighborhood Shopping     | Heavy Manufacturing        |                      |

Figure 4.2-2. Zoning

The upland areas of Mukilteo south of the project site and along SR 525 are designated SFR-H (Single-Family Residential: 5.8 Dwelling Units/Acre). Smaller areas along SR 525 near 84th Street SW are designated as PSP (Public Semi Public), DB (Downtown Business), COM (Commercial), and OS (Open Space).

The *Comprehensive Plan* has several policies addressing the Mukilteo ferry terminal, derived from the March 1995 *Mukilteo Multimodal/ Intermodal Terminal and Access Study and Programmatic EIS* (City of Mukilteo 1995). These policies include using the Central Waterfront Alternative as the basis for all planning activities related to the proposed Multimodal/Inter-Modal Terminal in downtown Mukilteo (Policy TR2).

The Mukilteo ferry terminal, SR 525, and the Mukilteo Station are identified as existing EPFs in Mukilteo's *Comprehensive Plan* and Section 17.18.010 of the City's Zoning Code. Both the City of Mukilteo and the City of Everett identify Mount Baker Terminal and the BNSF tracks as EPFs.

The City's plans for the waterfront, particularly for the area in the vicinity of the existing ferry terminal, presume that the terminal will be relocated to the Mukilteo Tank Farm, allowing redevelopment of the current terminal site. Mukilteo's *Comprehensive Plan* addresses development of transportation infrastructure on the Mukilteo Tank Farm in Policy TR4:

“Development of the Multimodal/Intermodal terminal and redevelopment of the Tank Farm site, should employ the following urban design techniques: a network of public paths, a waterfront promenade, a chain of waterfront parks, recreational opportunities such as a visitor dock and boat launch, new mixed use/commercial opportunities, public amenities downtown (e.g., benches, street lights, water fountains) and pedestrian oriented streetscapes.”

With the adoption of its 2012 update, the City revised this policy to place more emphasis on the public waterfront and recreational elements. The Waterfront Mixed Use District and Downtown Business District both carry design guidelines.

**Everett Comprehensive Plan.** Everett's *Comprehensive Plan* was last updated in 2011. The area that could be developed by the Mukilteo Multimodal Project is designated Waterfront Commercial (Figure 4.2-1). Policies for this area are contained in the Shoreline Master Program, which are addressed below.

**The Shoreline Management Act (SMA)** is a state-mandated cooperative program of shoreline planning with local government and state responsibilities (RCW 98.58.050).

The SMA provides a framework to maximize public access to shorelines. The SMA regulations also guide other developments that would provide an opportunity for substantial numbers of people to enjoy the shorelines of the state (RCW 90.58.020). Local plans must provide an economic development element for the location and design of industries, transportation facilities, port facilities, tourist facilities, commerce, and other uses that depend on being located on or using shorelines of the state (RCW 90.58.100).

**The Mukilteo Shoreline Master Program (SMP)** was adopted in 1974. A comprehensive update and revision to the SMP was approved by the City of Mukilteo in December 2011, and was also approved by Washington State Department of Ecology

(Ecology) (City of Mukilteo 2011). Figure 4.2-3 shows the City's SMP designations within the project area.

The project area is designated Urban Waterfront (UW), which is designed to provide for development and redevelopment of high-intensity, water-oriented commercial and recreational activities, transportation, and essential public facilities, while protecting existing ecological functions and improving ecological functions in areas that have been previously degraded.

The Mukilteo SMP (City of Mukilteo 2011) states that "Priority shall be given to water dependent uses, including ferry terminals and boat launches, in the Urban Waterfront Environment" (Policy UW1). Other policies also state that:

"With the exception of pedestrian, bicycle, and emergency vehicle access, ferry vehicle staging, shared parking spaces, vehicle circulation and parking systems which are not related to shoreline-dependent uses shall be located as far from the shoreline as possible and should utilize offsite parking options such as park-and-ride facilities" (Policy SH17).

The City's SMP provides for beach and tideland access along the western side of the city adjacent to Possession Sound. This program calls for a waterfront promenade and beach walk from Mukilteo Lighthouse Park to the east side of Mukilteo Tank Farm at the Everett city limits (17B.16.210, 17B.25.110, 17B.25.120 Design Guidelines 24, 17B.58.110).

The marine shoreline is classified as Critical Saltwater Habitat. This designation requires buffers to reduce potential impacts on the shoreline in accordance with best available science and as required by state or federal regulations. Buffer enhancement is required where existing buffer area vegetation provides minimal cover and cannot provide effective water quality or habitat functions.

**Everett's SMP** was last updated in 2011 (City of Everett 2011). The area that could be developed by the project is designated Urban Multi Use. Figure 4.2-3 shows the City's SMP designations within the project area. The purpose of this designation is:

"To ensure optimum use of shorelines within urbanized areas by providing for water oriented public and commercial activities, recreational and residential uses, and public access, and by managing development so that it enhances and maintains shorelines for a multiplicity of urban uses, while protecting and restoring ecological functions." The SMP specifically refers to a potential ferry development:

"This area is currently planned to be developed cooperatively with lands in the City of Mukilteo for a mixed use development to include some combination of recreational use, pedestrian paths and promenades, and commercial uses. The City of Everett shall redevelop its lands cooperatively and consistently with adjacent jurisdictions so that the entire site is an attractive and active waterfront with integrated commercial, transportation, and recreational components. This site shall be planned and developed cooperatively as part of a water-oriented mixed use development per the memorandum of understanding between the City of Everett, City of Mukilteo, Port of Everett, Department of Transportation Ferry System, and Sound Transit."

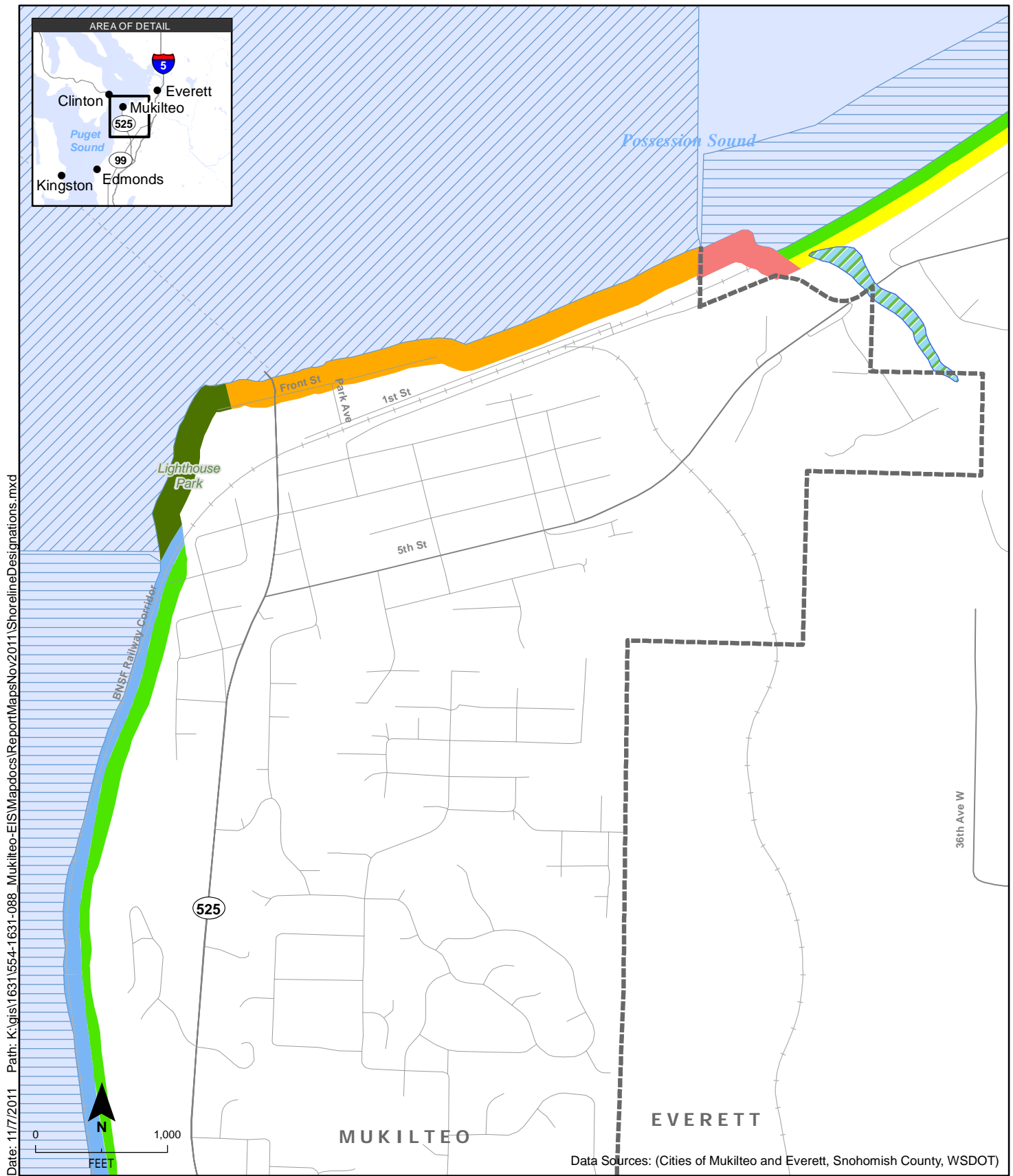


Figure 4.2-3. Shoreline Management Program Environmental Designations

**Coastal Zone Management (CZM) Program**, together with the Coastal Zone Management Act of 1972, requires activities of federal agencies that affect coastal zone land uses, water uses, or natural resources to be consistent with the state's CZM program. Compliance with the local SMP constitutes CZM compliance.

**Aquatic Lands Act**, formerly the Washington State Aquatic Lands Act of 1984, provides for the protection and management of state aquatic lands. These lands include the tidelands in the project area. The Aquatic Lands Act is administered through DNR, which carries out the legislative direction to foster water-dependent uses, ensure environmental protection, encourage direct public use and access, and achieve similar goals.

**PSRC *Transportation 2040*** identifies regionally important components of the area's metropolitan transportation system. It includes a complete list of projects and transportation system improvements as well as the Mukilteo ferry terminal relocation (PSRC 2010).

**Mukilteo Lighthouse Park Master Plan** guides the continued development of the park. The plan proposes relocating the existing boat launch to the Mukilteo Tank Farm, but the relocation is not an element of any of the Mukilteo Multimodal Project alternatives.

**Other Plans.** There are no federal land use plans specifically applicable to the project area.

The *Washington Transportation Plan 2007-2026* incorporates the Washington State Ferries Long-Range Plan by reference (WSTC and WSDOT 2006). It also refers to capital facility planning strategies for facilities including the Mukilteo terminal, but does not provide project-specific direction. *Chapter 1 Purpose and Need* provides more discussion of the ferry system's long-range strategic plan.

Washington's *State Comprehensive Outdoor Recreation Planning* document provides general guidelines and policies for state agency lands and facilities. These policies emphasize the importance of public access to state resources, including shorelines, and provide for the sustainable management of those resources.

## **Economic Base**

Mukilteo is primarily a residential community. It has a limited supply of commercial land, and residents rely primarily on retail centers in adjacent larger communities. Although Mukilteo residents have relatively high income levels and strong retail spending power, local businesses capture only a quarter of overall local spending. Even in convenience categories such as grocery, miscellaneous retail, and eating/drinking places, the businesses in the city are estimated to capture approximately half of the potential business from the city's residential market. The primary locations where residents do most of their shopping are Alderwood Mall in Lynnwood and Everett Mall. These competitors limit the retail opportunities in the city of Mukilteo.

In addition, there is a limit to available commercial zoned land in the city. The residential and commercial lands are approaching buildout. The city contains about 4 million square feet of commercial land. Commercial vacant and underdeveloped lands are constrained, with a limited supply existing in the southern end of the city.

Industrial market opportunities are similarly constrained by the lack of developable land in the city.

The median household income in Mukilteo is considerably higher than both the Snohomish County and Washington State median incomes, as indicated in Table 4.2-1. Travel time information confirms that most of the working population is employed outside of the city limits.

**Table 4.2-1. Mukilteo Population and Economic Characteristics**

	Mukilteo		Snohomish County		Washington State	
		Percent		Percent		Percent
Population (2010)	20,254	--	713,335	--	6,724,540	--
Population 16 or older in labor force (2000)	11,812	72.8	368,828	70.4	3,374,721	66.2
Mean travel time to work (minute)	25.5	n/a	29.8	n/a	25.4	n/a
Median household income (in 2010)	\$91,683	n/a	\$66,300	n/a	\$57,244	n/a
Per capita income (in 2010) <sup>1</sup>	\$40,649	n/a	\$30,635	n/a	\$29,733	n/a
Share of population below poverty level (2010)	n/a	5.7	n/a	8.4	n/a	12.1

n/a = not applicable

Source: U.S. Census (2010), American Community Survey (ACS) 2006-2010

<sup>1</sup> ACS B19301

Fairly low levels of growth are projected for Mukilteo as a whole and for the study area. The population within the existing boundaries of the city is expected to grow from about 20,250 in 2010 to 22,000 by 2025, and the majority of this growth would occur away from the study area. According to the *City of Mukilteo Comprehensive Plan* (City of Mukilteo 2012), there are approximately 190 undeveloped single-family residential lots in the city, about 250 underdeveloped lots, 250 lots in recent subdivisions, and capacity for approximately 229 multi-family units. Overall, there is the potential for about 990 additional dwelling units.

Within the study area, except for the Mukilteo Tank Farm, there are no undeveloped multi-family parcels, and very few single-family lots. Additional housing opportunities would likely come from mixed use development, especially in the downtown area and in the waterfront sub-area. The downtown area zoning allows for up to 999 square feet of accessory dwelling unit for each 1,000 square feet of commercial space constructed, with height limits that vary from 25 to 40 feet in the waterfront sub-area and 35 feet in the downtown business district.

### 4.2.3 Long-Term Environmental Impacts

The following sections address the anticipated long-term effects due to property acquisitions, changes in land use, or alteration of economic conditions as a result of the alternatives. While the EIS discussion evaluates the alternatives for their consistency with local comprehensive plans, the ferry terminal, as part of the state highway system, is considered an EPF and cannot be precluded by local plans or their permitting requirements. The ferry terminal itself is not subject to typical local

zoning requirements because it is part of the state highway system. The state transportation plan includes the terminal relocation, and the City of Mukilteo has anticipated the planned improvement for the terminal in its *Comprehensive Plan*, including the Plan's land use and transportation elements. WSDOT also developed the alternatives in collaboration with the City, and considered the City's *Comprehensive Plan* objectives in its designs as much as possible.

## **No-Build Alternative**

### ***Acquisition/Displacement***

WSDOT would maintain its interests in the currently leased portion of the holding area.

### ***Land Use Impacts***

This alternative would not directly alter existing land uses because the configuration of the terminal and the existing land uses in the vicinity would remain the same, including the vehicle holding area.

The over-water facilities for the ferry terminal would be consistent with the goals of the SMA and the Aquatic Lands Act administered by DNR because they are water-dependent uses. The No-Build Alternative would not fully provide improvements needed to meet other goals of both acts, such as environmental protection and direct public use and access.

The holding area is set back approximately 160 feet from the shoreline's ordinary high water mark (OHWM). This distance generally meets the criteria of accommodating the ferry terminal as a water-dependent use while locating ferry, vehicle staging, shared parking spaces, vehicle circulation, and parking systems as far from the shoreline as possible.

The continued presence of the terminal in the downtown area would not be consistent with the City's adoption of the Central Waterfront Alternative of the 1995 *Mukilteo Multimodal/ Intermodal Terminal and Access Study*. The study's Central Waterfront Alternative presumed the terminal would be relocated to the Mukilteo Tank Farm. Moreover, it would not be consistent with the City's desire to redevelop the existing ferry terminal area to provide a pedestrian-oriented waterfront along Front Street with mixed use on the south side of Front Street and a waterfront promenade extending from Mukilteo Lighthouse Park to the Mount Baker Terminal. This scenario is also reflected in the *City of Mukilteo Comprehensive Plan* Policies TR2 and TR3.

### ***Economic Impacts***

WSDOT would spend an estimated \$60 to \$65 million (2015 dollars) through 2030 for facility maintenance and structure replacements at the ferry terminal as they become necessary. This expenditure would provide short-term economic activity through job creation, purchase of materials, and sales tax revenue to the state. The alternative would generate approximately 230 short-term construction jobs, which is estimated by using a standard multiplier for the type of construction. Indirectly, these jobs would generate about 150 additional jobs in the region because these workers would spend some of their income on local goods and services. Direct sales tax revenues from the project are

estimated at about \$2.8 million. The City of Mukilteo, however, is likely to receive only a small portion of this tax revenue because suppliers of materials are not likely to be located in Mukilteo.

The No-Build Alternative would maintain current land uses and economic activities on the site and in the immediate vicinity. The traffic congestion associated with the terminal, particularly on Front Street, would continue to constrain access to businesses; some businesses perceive this constraint as reducing their economic viability. However, some ferry patrons would buy convenience items or other products or services from businesses in the immediate vicinity.

Impacts on the range of economic activities that could develop along the Mukilteo waterfront are discussed under indirect and cumulative impacts (*Sections 4.2.5 and 4.2.6*).

## **Preferred Alternative**

### ***Acquisition/Displacement***

This alternative would affect the following properties:

- The Mongrain Building, which houses glass blowing studios and other businesses at Park Avenue and First Street, would be acquired for the First Street extension, and the uses would be displaced. At this time, a specific site for relocating the associated businesses has not been identified, but compensation and relocation assistance would be provided in compliance with applicable regulations. The requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 United States Code [USC] 4601) are discussed below in *Section 4.2.7*.
- WSDOT would buy a portion of a parcel it currently leases for the existing terminal.
- Approximately 9 acres of the Mukilteo Tank Farm would be developed.
- The existing Port of Everett fishing pier and seasonal day moorage on Port of Everett property would be removed.

### ***Land Use Impacts***

The over-water facilities for the ferry terminal would be consistent with the SMA goals and the Aquatic Lands Act because they are water-dependent uses.

The location of the alternative within the Mukilteo Tank Farm would be consistent with the *City of Mukilteo Comprehensive Plan*.

Parts of the vehicle holding area and transit facilities have a narrower shoreline setback than the SMP defines for non-water-dependent uses. The SMP criterion also requires other non-water dependent features, such as parking, to be as far back from the water as possible.

The Preferred Alternative generally conforms with the City of Mukilteo SMP policies, although some design elements do not fully meet the program's exact

specifications. Further coordination with the City of Mukilteo will take place during final design and permitting.

A continuous shoreline promenade would be provided and pass through the passenger terminal. If possible, the terminal design would incorporate public viewpoints along this part of the promenade.

The promenade would contribute to the 20 percent of open space and public access required by City of Mukilteo SMP policies for development on the Mukilteo Tank Farm. While the promenade would not alone satisfy the requirement, it would not preclude the development of open space on other parts of the ferry terminal or other portions of the tank farm.

The design for the Preferred Alternative creates an additional parking area at SR 525 to address changes in on-street parking spaces along Park Avenue and First Street. The design also avoids parking impacts at Mukilteo Station. On-street and off-street parking supply for the waterfront area would increase slightly.

### ***Economic Impacts***

WSDOT would spend about \$125 to \$135 million (2015 dollars) to construct the Preferred Alternative, including the pier removal. This would provide short-term economic activity through job creation, purchase of materials, and sales tax revenue to the state. Based on a standard multiplier for the type of construction, the project would generate approximately 380 short-term construction jobs. Indirectly, these jobs would generate about 250 additional jobs in the region because these workers would spend some of their income on local goods and services. The City of Mukilteo is likely to receive only a small portion of direct tax revenue from the purchase of materials because suppliers of materials are not likely to be located in Mukilteo.

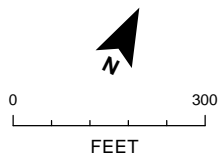
The acquisition of an existing building and the displacement of its associated uses would not have a substantial impact on the overall economic base of Mukilteo given the 4 million square feet of commercial use in the city, but it would affect the businesses using the building. This acquisition is unlikely to affect the viability of the local commercial area, especially if the existing terminal site is made available for redevelopment. The potential redevelopment is discussed under indirect and cumulative impacts (*Sections 4.2.5 and 4.2.6*).

### **Existing Site Improvements Alternative**

#### ***Acquisition/Displacement***

As shown in Figure 4.2-4, this alternative would require the following acquisitions:

- The existing Port of Everett fishing pier and seasonal day moorage would be removed.
- The existing Ivar's restaurant on the shoreline would be acquired for a new passenger building. The parking lot south of Front Street would be acquired for employee parking and the transit center. There is little potential for relocating the restaurant in the vicinity.
- The property currently leased for the ferry holding area would be acquired for the reconfigured vehicle holding area and the transit center.



- ① Port of Everett Fishing Dock/Moorage
- ② Ivar's Restaurant
- ③ Lot owned by A&J Enterprises (currently leased by WSF)
- ④ Parking Lot for Ivar's Restaurant
- ⑤ Mongrain Building

- All Alternatives
- Existing Site Improvements Alternative Only

**Figure 4.2-4. Properties Affected by the Alternatives**

- The Mongrain Building, which houses glass blowing studios and other businesses at Park Avenue and First Street, would be acquired, and its uses would be displaced.

### **Land Use Impacts**

This alternative would have few direct impacts on existing land uses because the configuration of existing land uses in the vicinity would change little. The expanded terminal would eliminate a sizable restaurant, which is one of the few businesses on the waterfront that attracts a substantial number of people. The displacement of this business would conflict with the City's goal of providing a pedestrian-oriented waterfront along Front Street.

The vehicle holding areas would be expanded. This area is set back approximately 160 feet from the edge of the water, and generally meets the criteria of accommodating the ferry terminal as a water-dependent use while locating ferry vehicle staging, shared parking spaces, vehicle circulation, and parking systems as far from the shoreline as possible.

Plans for the new passenger terminal facility remain conceptual; it is unknown at this time whether the terminal would allow public enjoyment of the water. This alternative does not advance the SMP provisions that call for continuous access along a waterfront promenade extending from Mukilteo Lighthouse Park to the Mount Baker Terminal. At-grade pedestrian crossings of the ferry loading area would still be provided via sidewalks, which is similar to today with crossings limited during loading and unloading.

Some public parking spaces on Front Street and Park Avenue that are typically used by local business patrons and persons accessing the shoreline would be eliminated. Demand for parking may not be adequately accommodated by the remaining spaces.

The displacement of the Port of Everett fishing pier would represent a net loss of shoreline public access facilities if it were not replaced.

Accommodation of the over-water facilities for the ferry terminal would be consistent with the SMA goals and the Aquatic Lands Act.

The continued presence of the terminal in the downtown area would not be consistent with the City's *Comprehensive Plan*, which envisions creating a transit-oriented destination on the Mukilteo Tank Farm and supporting the redevelopment of the existing terminal site.

### **Economic Impacts**

WSDOT would spend about \$130 to \$140 million (2015 dollars) to construct this alternative. This would provide short-term economic activity through job creation, purchase of materials, and sales tax revenue to the state. Based on a standard multiplier for the type of construction, the alternative would generate approximately 490 short-term construction jobs. Indirectly, these jobs would generate about 325 additional jobs in the region because these workers would spend their income on local goods and services. Sales tax revenues are estimated at about \$6.2 million. The City of Mukilteo is likely to receive only a portion of direct tax revenue from the purchase of construction materials because all suppliers are not likely to be located in Mukilteo.

Traffic congestion associated with the terminal would continue, particularly on Front Street. Congestion affects access to businesses and is perceived by some to reduce their economic viability.

The displacement of two properties with approximately seven existing businesses would not have a substantial impact on the overall economic base of Mukilteo given that there are 4 million square feet of existing commercial space throughout the city. The City of Mukilteo estimates a potential loss of \$50,000 annually in sales tax revenue from the businesses. An estimated 30 to 40 employees would be affected by the business displacements. Removal of Ivar's restaurant would eliminate the only business along the shoreline that provides opportunities for a close view of the water. There is little potential for relocating the restaurant in the immediate vicinity because of the lack of privately owned sites. There may be potential for relocation in the future to portions of the Mukilteo Tank Farm, but this would depend on several other factors, including the availability of the land, and when the Port or others would be able to prepare the site for development.

Impacts due to other potential developments along the Mukilteo waterfront are discussed under indirect and cumulative impacts (*Sections 4.2.5 and 4.2.6*).

## **Elliot Point 1 Alternative**

### ***Acquisition/Displacement***

This alternative would affect the following properties:

- The Mongrain Building, which houses glass blowing studios and other businesses, at Park Avenue and First Street would be acquired, and its uses would be displaced.
- Approximately 11 acres of the Mukilteo Tank Farm would be developed.
- The Mount Baker Terminal public shoreline access area's layout would be altered to accommodate vehicle access to the terminal. See *Chapter 5 Section 4(f)* for further discussion of impacts and mitigation for parks and recreation resources.

### ***Land Use Impacts***

This alternative would have a variety of impacts in relation to the applicable land use plans.

City of Mukilteo policies call for 20 percent of the development within the Mukilteo Tank Farm to be provided as open space or public access. The shoreline promenade and the daylighting of Japanese Creek would help meet this requirement.

Accommodation of the over-water facilities for the ferry terminal would be consistent with the goals of the SMA and the Aquatic Lands Act.

This ferry terminal location would be consistent with the *City of Mukilteo Comprehensive Plan*.

The vehicle holding area, transit facilities, and parking area would have minimal setback from the water and would not generally meet the SMP criterion for locating non-water-dependent uses as far from the shoreline as possible.

This alternative would respond to the SMP provisions that call for continuous access along the waterfront promenade extending from Mukilteo Lighthouse Park to the Mount Baker Terminal. It only partially achieves the objective by providing walkways along much of the shoreline and bicycle and pedestrian facilities set back from and parallel to the shoreline. Continuous pedestrian movement along the shoreline is interrupted by the ferry loading area. To access the shoreline promenade east of the ferry terminal, a pedestrian would have to walk to First Street and travel about 1,500 feet to get back to the promenade immediately east of the ferry loading area.

The location of the passenger terminal and maintenance facility on an over-water structure might conflict with SMP Policy UW 13, which limits new over-water structures to the minimum necessary to support the structure's intended use, and also requires shared pedestrian access.

The alternative would maintain parking spaces and public access to the shoreline access area at the Mount Baker Terminal, but would alter the site's current layout. Public access is required under a permit condition for the Mount Baker Terminal. The Everett Shoreline Substantial Development Permit requires a permanent public access road, although implementation was delayed pending the Mukilteo Tank Farm transfer to the Port.

### ***Economic Impacts***

WSDOT would spend about \$150 to \$165 million (2015 dollars) to construct this alternative and remove the Tank Farm Pier. This would provide short-term economic activity through job creation, purchase of materials, and sales tax revenue to the state. Based on a standard multiplier for the type of construction, the project would generate approximately 475 short-term construction jobs. Indirectly, these jobs would generate about 315 additional jobs in the region and some workers would spend their income on local goods and services. Sales tax revenues are estimated at about \$6 million, a portion of which may go to the City of Mukilteo.

The acquisition of an existing building and the displacement of its associated uses would not have a substantial impact on the overall economic base of Mukilteo given the 4 million square feet of commercial use in the city, but it would affect the businesses using the building. It is unlikely to affect the viability of the local commercial area, especially if the existing terminal is made available for redevelopment.

Potential development on the existing ferry terminal site and the Mukilteo Tank Farm site is discussed under indirect and cumulative impacts (*Sections 4.2.5 and 4.2.6*).

## **4.2.4 Construction Impacts**

### **No-Build Alternative**

Construction would take place only as facilities require replacement, and would occur on lands already dedicated to transportation uses. Construction would have temporary effects on adjacent uses from noise, and possibly temporary disruption of traffic

circulation. Construction would occur only as specific facilities warrant major repair or replacement and would take place on limited facilities at any one time. The ferry terminal would be closed temporarily for work on in-water facilities.

Construction would temporarily disrupt access to local businesses, but is not expected to be severe enough to change land use during construction. Economic impacts during construction could result from avoidance of the area by retail and restaurant customers due to disruption of traffic circulation and noise impacts. Such impacts, however, are expected to be managed by WSDOT to ensure they do not adversely affect the economic viability of any businesses.

### **Preferred Alternative**

Construction would take place on a separate site, and the existing terminal would operate until construction is complete and new facilities are opened. Noise or traffic from the construction of new facilities and demolition of existing facilities may affect adjacent uses, including a hotel and the NOAA facility. However, construction impacts are unlikely to result in a change in land use or adversely affect the economic viability of adjacent land uses because noise-sensitive receptors are farther away. There is also the potential for temporary construction access routes to adversely affect the redevelopment of nearby properties, such as the NOAA laboratory, if the projects occurred concurrently.

### **Existing Site Improvements Alternative**

Construction is likely to have temporary noise impacts on adjacent uses, such as a condominium building and the Silver Cloud Inn, and possibly temporary disruption of traffic circulation. The loss of ferry service for an anticipated 1- to 2-month period may have economic impacts on businesses due to retail and restaurant customers avoiding the area because of disruption in traffic circulation and noise impacts. Businesses that depend on ferry traffic for patronage would experience a decrease in business during ferry closures.

### **Elliot Point 1 Alternative**

Construction impacts would be similar to the Preferred Alternative.

## **4.2.5 Indirect and Secondary Impacts**

### **No-Build Alternative**

The indirect impacts from retaining the existing site would include increased traffic-related problems; the City of Mukilteo has stated that these issues would constrain the development of its downtown waterfront area. Ferry operations would be similar to present conditions. Traffic congestion on local roadways at peak periods would continue to worsen as current problems remain unsolved. However, traffic congestion would likely not affect existing land use or have economic effects different from those described as direct impacts.

## **Preferred Alternative**

The relocation of the ferry terminal to the Mukilteo Tank Farm would result in more efficient ferry operations. At peak periods, operational delays would be less frequent. Traffic congestion on local roadways at peak periods would be less because of the greater capacity of the holding area. The development of an access road to the Mukilteo Tank Farm would also allow the Port of Everett to complete the public access route needed to open its shoreline area, as planned for the Mount Baker Terminal.

Plans to revitalize the waterfront would be supported by the expansion of the active waterfront area and the development of the access road and shoreline promenade. Unused areas of the tank farm site as well as areas vacated by WSDOT could provide increased opportunities to develop public open spaces or other uses consistent with the adopted land use plans of the Cities of Mukilteo and Everett. Design elements and interpretive features that reflect the site's rich cultural history and marine setting could also make the area more attractive to visitors.

## **Existing Site Improvements Alternative**

Potential traffic-related indirect impacts would be similar to the No-Build Alternative discussed above, although perhaps to a lesser extent due to the reconfiguration of facilities and a new intersection at First Street.

The displacement of parking for oversized vehicles, Ivar's restaurant, and another local business could reduce non-ferry patronage to the area as well as decrease patronage for other commercial uses. This might slow or constrain the City's ability to develop the area consistent with its plans. Design features or interpretive elements reflecting the area's historic significance could make the area more attractive to visitors and patrons.

## **Elliot Point 1 Alternative**

Potential indirect impacts would be similar to the Preferred Alternative discussed above; however, this alternative could potentially improve SR 525 congestion even more during peak travel times because the access roadway can hold more vehicles. As with the Preferred Alternative, the opportunity to integrate context-sensitive designs and open spaces reflecting the site's history and marine setting would help support revitalization of the area.

### **4.2.6 Cumulative Impacts**

Land use trends were established within a short period after the Puget Sound region was settled by non-indigenous people in the 19th century. While development began in Mukilteo around the same time, it accelerated in the 1950s and 1960s with the construction of the Mukilteo ferry terminal and I-5. The land uses at the waterfront area have changed over time following development of the railroad and subsequent development of lumber, industrial, and shipping uses. This was followed by the military uses on what is now the Mukilteo Tank Farm. Other changes have included the development of the ferry terminal, the steady development of the surrounding neighborhoods in Mukilteo, and the transition to the existing uses in the area today.

For the future, the City of Mukilteo's land use planning for the waterfront reflects an increasing emphasis on the shoreline as a valuable public and environmental resource.

The City and Sound Transit are considering other longer term plans for adding parking for the Mukilteo Station, and are considering various sites along the waterfront. Depending on the ultimate site, the addition of parking could help support the City's waterfront vision.

These plans and projects could encourage future developments and changes to existing land uses, particularly in the area north of the BNSF tracks. Future developments would be subject to the conditions established by the City of Mukilteo's adopted land use plans, so these developments would be consistent with the City's land use goals and policies.

### **No-Build Alternative**

This alternative would not directly affect the Mukilteo Tank Farm. With the transfer of the Mukilteo Tank Farm to the Port of Everett, the parcel would be available for redevelopment under Mukilteo and Everett land use regulations. The City of Mukilteo has proposed to relocate the boat launch ramp currently located at the Mukilteo Lighthouse Park; it could be accommodated at the Mukilteo Tank Farm.

If the redevelopment of the Mukilteo Tank Farm relies on the existing road network, traffic congestion at SR 525 and Front Street could constrain access, which could limit redevelopment of the Mukilteo Tank Farm.

NOAA's plans for the Mukilteo Research Station within its portion of the Mukilteo Tank Farm include:

- Upgrading laboratories for the study of ocean toxicology, restoration of marine species and ecosystems, and ocean acidification
- Developing a new outreach and education center on the waterfront
- Rebuilding the existing pier, replacing or improving the clean seawater supply system used for laboratory research
- Improving support facilities for a fleet of small boats, field gear, and supplies

These changes would be subject to the City of Mukilteo's development regulations and are not likely to affect land uses in the vicinity or change redevelopment options for other portions of the Mukilteo Tank Farm.

The discussion of direct effects for this alternative noted that it would not support the City of Mukilteo's land use policies focusing on redeveloping the existing terminal and nearby lands. In the long term, the presence of the terminal and associated traffic congestion, particularly on Front Street, may affect the economic viability of businesses that depend on convenient access for their customers, especially non-ferry customers. It is possible, however, that the continuing presence of the ferry terminal would provide a customer base that would support existing establishments, and could lead to other businesses oriented to persons waiting to board ferries.

As indicated above, traffic congestion at SR 525 and Front Street could impede redevelopment of the Mukilteo Tank Farm and curtail economic activity.

### **Preferred Alternative**

Relocation of the ferry terminal would allow WSDOT to release its interests in the existing vehicle holding area as well as at the existing terminal building. This could result in approximately 1 acre of land (not including First Street) available for other uses, subject to the City of Mukilteo mixed use zoning requirements. Under City codes, this area could accommodate about 66,000 to 160,000 square feet of first-floor retail space, depending on whether surface or structured parking were used. It would also accommodate between 80 and 160 upper-story residential units, depending on available parking and number of floors. NOAA's planned redevelopment of its facility could contribute to a more integrated district. Otherwise, the impacts of NOAA facilities considered for development in the area would be the same as described under the No-Build Alternative.

Areas on the Mukilteo Tank Farm that are not needed for the Preferred Alternative could be available for other uses, including future redevelopment. This could result in the waterfront area having diverse land uses and economic functions rather than functioning as a single district. The City's policies require 20 percent of the Mukilteo Tank Farm site be reserved for public use or open space. The Preferred Alternative includes a promenade, which would contribute to meeting this requirement. Development plans for other parts of the Mukilteo Tank Farm would also be required to contribute to the 20 percent public use or open space requirement.

The anticipated relocation of the City of Mukilteo boat launch ramp currently at Mukilteo Lighthouse Park could be accommodated at the Mukilteo Tank Farm. The ramp would have to be located east of the ferry terminal and would require additional access and site development. This could potentially be combined with the completion of public access serving the Port of Everett's shoreline access area at the Mount Baker Terminal.

Also, the City of Mukilteo is working with Sound Transit to explore concepts for developing additional parking facilities for the waterfront, including potentially a parking garage. These plans are in early stages and the size, location, timing, and configuration of the facilities are not yet known. Increased parking could address problems associated with limited parking for the Mukilteo Lighthouse Park and could help make the waterfront area more accessible to more visitors and business patrons.

### **Existing Site Improvements Alternative**

If the terminal remains at its current location, NOAA facilities could still be improved and the City could still relocate its boat launch on the Mukilteo Tank Farm, and other areas of the tank farm could be available for redevelopment by others, which would generate economic activity. However, traffic congestion at SR 525 and Front Street could impede redevelopment, although to a lesser extent than with the No-Build Alternative because the extension of First Street to a new signalized intersection at SR 525 would improve traffic operations in the area.

## Elliot Point 1 Alternative

As with the Preferred Alternative, relocation of the ferry would likely result in WSDOT releasing its interests in the existing vehicle holding area, which would allow redevelopment of the area.

For development of the Mukilteo Tank Farm, the City's policies require 20 percent of the site be reserved for public use or open space. The Elliot Point 1 Alternative includes a promenade and daylighting of Japanese Creek, which would partially meet this requirement. However, development plans for other parts of the Mukilteo Tank Farm would be required to help satisfy the requirement.

If the existing holding area can be developed, along with other remaining developable areas on the Mukilteo Tank Farm, the entire area would have more potential to function as a single business district as compared to the Preferred Alternative. The configuration of the parcel reserved for NOAA could contribute to a more integrated district. Otherwise, the impacts of NOAA facilities considered for development in the area would be the same as described under the No-Build Alternative.

The City of Mukilteo boat launch ramp could be relocated from the Mukilteo Lighthouse Park to be part of the Elliot Point 1 Alternative development on the Mukilteo Tank Farm, but details of its access and siting would require further planning.

### 4.2.7 Mitigation Measures

Acquisition of private property would occur under all Build alternatives. WSDOT would provide compensation at fair market value for property and property rights acquired; relocation assistance for displacement would be provided in accordance with applicable federal and state regulations.

If the project uses federal funding, then it must comply with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 USC 4601). The act establishes a uniform policy on relocation assistance and on real property acquisition practices for programs or projects undertaken by a federal agency or with federal financial assistance. The primary purpose of this policy is to minimize the hardship of displacement on people and ensure that they do not suffer disproportionate injuries. As defined by this federal act, a displaced person is any person (family, partnership, corporation, or association) who moves from or moves their personal property from the real property affected (49 CFR Part 24.2).

The Washington State Real Property Acquisition Policy Act (RCW 8.26) is similar, except it establishes policy for the public works programs and acquisition practices of state and local governments. Implementing regulations for WSDOT are found in Washington Administrative Code (WAC) 468-100; all activities related to acquisitions, displacements, and relocations will comply with the requirements of this regulation. According to the state's property acquisition act, a displaced person who is required to move can include any individual, family, partnership, corporation, or association who moves or moves their personal property from the real property affected (RCW 8.26.020(4)).

For the Preferred Alternative, mitigation measures include:

- WSDOT would work with the City of Mukilteo during final design to resolve areas where the project does not fully meet Shoreline Management Plan criteria. WSDOT may modify the project's design, or it may ask the City for an exemption or provide other compensatory features such as additional open space as mitigation. Potential final design modifications could include increasing the setback for non-water-dependent elements; reducing storage lane capacity where the current design exceeds the capacity required under WSDOT's design criteria; modifying the location of the employee parking area; or increasing the setback for the transit area. However, potential final design modifications will need to consider WSDOT's design criteria for ferry terminals, impacts on potential archaeological resources, other environmental impacts, tradeoffs in transportation benefits and safe and secure facility operations, and other factors.

For the Existing Site Improvements Alternative potential mitigation measures include:

- Provision of public access facilities specified in the SMP could be accommodated by providing a pedestrian walkway on the water side of the proposed passenger terminal separated from ticketed ferry passengers. An example of such a facility is at the adjacent Silver Cloud Inn; however, this walkway would create additional over-water coverage.
- A pedestrian overpass over the ferry loading area would accommodate public access along the shoreline without pedestrian and vehicle conflicts.

For the Elliot Point 1 Alternative potential mitigation measures include:

- Changes in the site plan that could help the alternative meet the SMP criteria of locating vehicle-related elements (e.g., parking) farther from the shoreline. However, feasible options must meet the project's purpose and need while contending with the site's many physical and environmental constraints. For instance, one approach that would move vehicle-related elements away from the shoreline may cause additional impacts on cultural resources, may hinder opportunities to daylight Japanese Creek (or require bridging the creek), and may degrade the efficiency of ferry operations. Options must be evaluated in terms of tradeoffs in transportation benefits and safe and secure facility operations. If the site plan cannot be adjusted to meet the SMP criteria without unacceptably compromising the project's purpose and need or creating unacceptable impacts on environmental or cultural resources, a mitigation strategy would provide compensatory open space areas along the shoreline in areas west of the terminal.
- Locating the passenger terminal and maintenance facilities on land rather than on an over-water structure would respond to SMP policies limiting over-water facilities to the minimum needed. However, this would involve assessing the tradeoffs among public open space, public access, distances traveled by pedestrians to access ferries, operational needs, and other environmental effects.

- The displacement of a portion of the upland recreation area provided as part of the shoreline access area at the Mount Baker Terminal could be compensated by providing similar recreation areas elsewhere on the ferry terminal site or the larger Mukilteo Tank Farm site (see *Chapter 5 Section 4(f)* for more detail).
- Policies for a continuous pedestrian promenade along the shoreline, combined with an open space corridor, would need to be addressed by WSDOT and the City of Mukilteo at the time of final design and permitting. WSDOT and the City of Mukilteo would need to determine whether there are options to the current proposal that provide a continuous corridor along the water and also recognize the security needs of the terminal.

To reduce construction impacts on existing businesses and public land uses for all alternatives, the following measures would be taken:

- Through final design, permitting, and outreach to the affected properties, WSDOT will confirm the specific measures to minimize impacts on adjacent land uses, in coordination with the City of Mukilteo as part of required permitting.
- Construction timing of key elements that disrupt business access would be planned for seasons or times of day when business peak operations would be less disrupted.
- Detour routes would be clearly marked to provide clear routes to access businesses and existing public access areas, and temporary parking would be provided on parcels acquired before construction, as practicable. The location of any temporary access routes would be designed in coordination with nearby property owners to minimize potential conflicts to the extent practicable; construction activities would be conducted as defined in construction permits required by the City of Mukilteo.
- A program of public information and business outreach would assist businesses in planning deliveries and other essential support activities around construction times.
- A public information campaign to inform the public that businesses are open would encourage patronage at these businesses during construction.

### 4.3 Noise and Vibration

Sound and vibration are around us all the time but may become a nuisance or create an adverse effect when they are too loud, too frequent, or disruptive to normal activity. Sound is any change in air pressure that the human ear can detect, from barely perceptible sounds to sound levels that cause hearing damage; the greater the change in air pressure, the louder the sound. When sounds are unpleasant or disturbingly loud, they are generally considered “noise.” Although human response to noise varies from person to person, identifying and mitigating project-related noise can reduce noise impacts on the population at large.

This section analyzes potential land-based sound and vibration impacts that would result from both the roadway improvements and the multimodal transit facilities. Potential aquatic noise impacts are discussed in *Section 4.12 Ecosystems*. The information in this section is based on the findings of the *Noise and Vibration Discipline Report*, which is an appendix to this EIS.

### **4.3.1 Overview of Analysis and Regulatory Context**

#### **Regulatory Context**

State and local laws regulate noise from operational activities of land uses but do not regulate noise from traffic on public roadways. Construction noise is addressed by Washington Administrative Code, Chapter 173-60 (WAC 173-60), and local governments typically apply noise control measures for construction through their land use codes.

In accordance with the FTA's *Transit Noise and Vibration Impact Assessment* guidance manual, an inventory of the potentially affected properties was identified in a screening process. There are no noise- or vibration-sensitive locations within the screening distance of the No-Build and Elliot Point 1 alternatives; six noise-sensitive locations were identified with the Existing Site Improvements Alternative. Two noise-sensitive locations were within the screening distance of the Elliot Point 2 Alternative (as presented in the Draft EIS); however, the design refinements for the Preferred Alternative (Elliot Point 2 Alternative) relocated the parking facility so that there are no noise-sensitive receptors within the screening distance for this alternative.

The analysis of potential noise impacts uses FTA's methods to evaluate noise and vibration levels caused by transit- and ferry-related elements of the project alternatives, along with Federal Highway Administration (FHWA) methods for assessing noise impacts associated with roadways. Further detail is available in the *Noise and Vibration Discipline Report*.

#### **Background Information About Noise Levels**

Various descriptors are used for sound and noise levels, including the A-weighted decibel scale (dBA), sound level equivalents (Leq), day-night average sound levels (Ldn), and percentile levels. The most common measurement of sound and environmental noise is the dBA. This is a logarithmic scale that ranges from 0 dBA to about 140 dBA and approximates the range of human hearing. The threshold of human hearing is about 0 dBA; less than 30 dBA is very quiet; 30 to 60 dBA is quiet; 60 to 90 dBA is moderately loud; 90 to 110 dBA is very loud; and 110 to 130 is uncomfortably loud. Figure 4.3-1 shows typical noise levels from various sources.

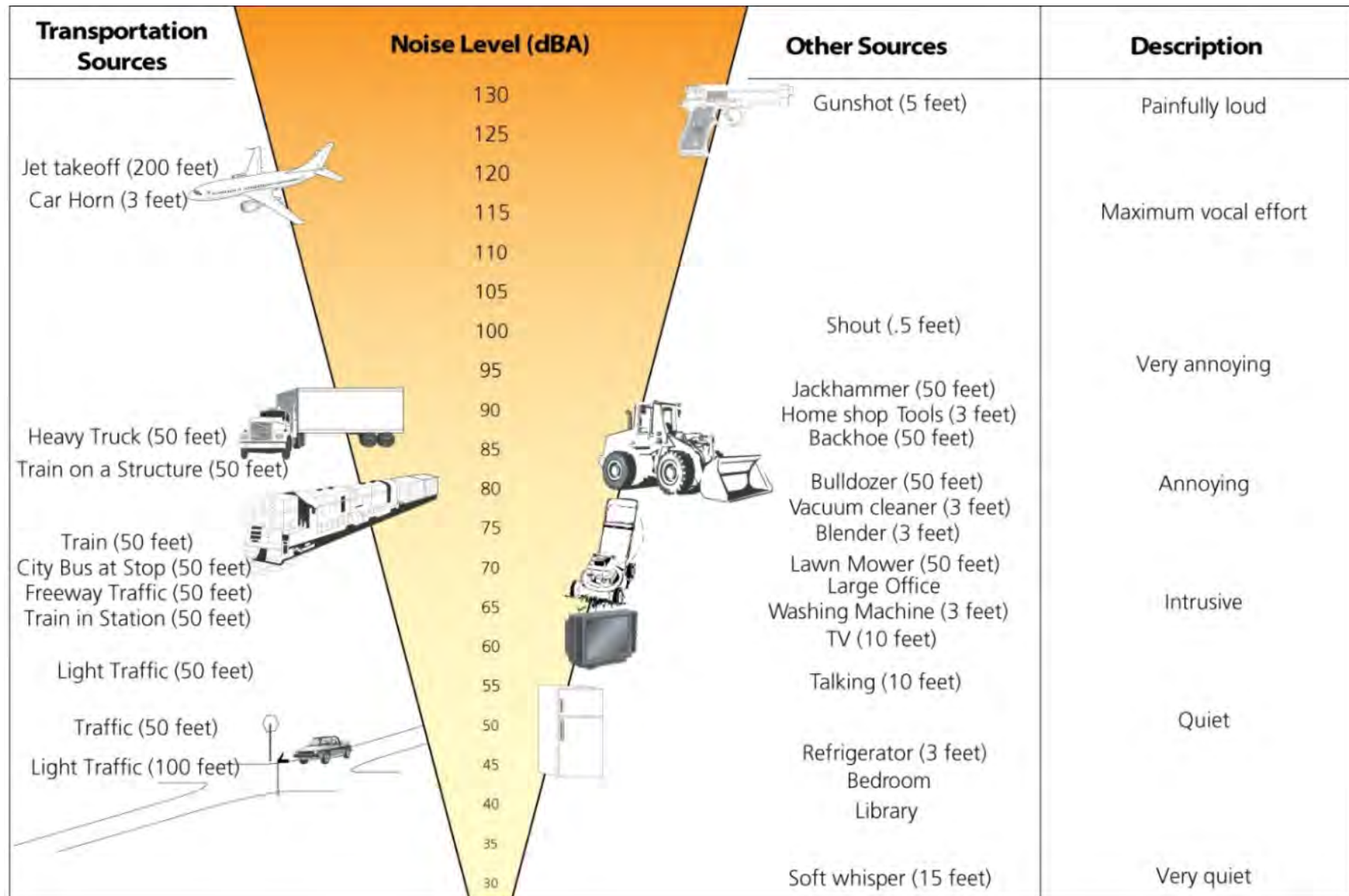


Figure 4.3-1. Expected Decibel Levels from Various Noise Sources

Human conversation generally ranges between 44 and 65 dBA when people are about 3 to 6 feet apart. The smallest change in noise level that the human ear can perceive is usually a 3 dBA increase in noise. An increase of 5 or 6 dBA is readily noticeable, and sound that increases by 10 dBA appears to be twice as loud to most listeners. A doubling of the number of noise sources, such as the number of cars operating on a roadway, increases noise levels by 3 dBA (FHWA and WSDOT 2006). A tenfold increase in the number of noise sources will usually add 10 dBA to the background noise levels. As a result, a noise source emitting a noise level of 60 dBA combined with another noise source of 60 dBA yields a combined noise level of 63 dBA, not 120 dBA.

Noise levels decrease with distance from the noise source. For a linear source such as a roadway, noise levels decrease 3 dBA over hard ground (concrete or pavement) or 4.5 dBA over soft ground (grass) for every doubling of distance between the source and the receptor. For a point source such as a construction activity, noise levels decrease between 6 and 7.5 dBA for every doubling of distance from the source.

Noise levels from traffic sources depend on volume, speed, and the type and condition of vehicles. Generally, an increase in volume, speed, or vehicle size increases traffic noise levels. Vehicle noise is a combination of noises from the engine, exhaust, and tires. Malfunctioning vehicle parts (such as mufflers) can increase traffic noise. Noise travels in a straight line-of-sight path between the source and a receiver. Terrain, along with shielding by barriers and buildings, can greatly affect the propagation of noise.

## **Overview of Analysis**

The potential for long-term noise impacts from the operation of the project alternatives was evaluated using models designed to predict transportation-related noise.

Potential construction noise and vibration effects were evaluated qualitatively because of the temporary nature of construction and the variability of the construction activities. However, given the typical types of equipment used, the location of the Build alternatives, and the overall schedule for construction, a qualitative assessment still allows impacts and mitigation to be identified.

### **4.3.2 Affected Environment**

Noise sources in the project area include air traffic to and from Paine Field airport, freight and passenger trains on the BNSF railroad, barge and rail traffic at Mount Baker Terminal, automotive traffic on SR 525 and local streets, and ferry arrivals and departures at the Mukilteo ferry terminal. South of the railroad tracks, the railroad dominates the noise levels, and residents experience comparatively minor levels of noise from the existing ferry terminal, airport, transfer facility, and roadway traffic. North of the railroad tracks, rail vehicles and ferry traffic along SR 525 add to the ambient sound level for residential land uses nearest the waterfront.

Table 4.3-1 lists noise monitoring locations and their measured sound levels. Measurements at seven receivers represent the existing ambient (or background) sound levels in the project vicinity along the waterfront. The variations show how

sound levels at some locations can be affected by passing trains or by traffic. The project also includes a site (MMM-1) representing typical sound levels near the ferry terminal as experienced by people at the Losvar Condominiums and Silver Cloud Inn. The dominant sound levels at MMM-2 came from the docking ferry and people on the beach.

**Table 4.3-1. Project Noise Monitoring Locations and Findings (dBA)**

Project Site No.	Address	Day/Night Measurement Range	Time Period	15- to 30-Minute Noise Levels	Calculated 24-Hour Levels
RBTF-1	1146 Second Street	39.5 to 76	68 hr.	n/a	76.7
RBTF-2	1513 Mukilteo Lane	38.1 to 58.7	68 hr.	n/a	57.7
TM-1	615 Third Street	49.7 to 64	24 hr.	n/a	66.2
TM-2	822 Second Street	42.4 to 71.9	24 hr.	n/a	70.4
AA-1	103 Cornelia Avenue	n/a	30 min.	71.6	69.6
MMM-1	612 Third Street	n/a	15 min.	70.4	68.4
MMM-2	NOAA Mukilteo Research Station	41 to 55.3	13 hr.	n/a	52.1

n/a = not applicable

RBTF = Port of Everett Satellite Rail/Barge Transfer Facility Noise Analysis, May 2004

TM = Noise Monitoring Tech Memo, October 2004

AA = Adolfson Associates, March 2005

MMM = Mukilteo Multimodal Measurements, March 2011

### 4.3.3 Long-Term Environmental Impacts

This section describes how noise and vibration could affect noise- and vibration-sensitive locations. Table 4.3-2 provides an inventory of properties identified in the screening process. Only sites identified in this inventory require additional assessment of potential noise or vibration effects. The *Noise and Vibration Discipline Report* contains additional information about the analysis, and it also shows monitoring locations and noise- or vibration-sensitive properties.

**Table 4.3-2. Noise and Vibration Sensitive Receptors Inventory**

Noise- and Vibration-Sensitive Receptors	Project Elements			
	Ferry Vessel Terminal Dock	Parking Facility	SR 525 and Access Roads	Transit Center and Mukilteo Station
<b>No-Build Alternative</b>				
None	No Noise- or Vibration-Sensitive Receptors			
<b>Preferred Alternative</b>				
None	No Noise- or Vibration-Sensitive Receptors			
<b>Existing Site Improvements</b>				
Losvar Condominiums	Noise	Noise	--	--
Silver Cloud Inn	Noise	Noise	Noise	Noise
111 Park Avenue	--	--	--	Noise
724 Second Street	--	--	--	Noise
726 Second Street	--	--	--	Noise
728 Second Street	--	--	--	Noise
<b>Elliot Point 1 Alternative</b>				
None	No Noise- or Vibration-Sensitive Locations Identified			

### **No-Build Alternative**

The No-Build Alternative would not change noise-generating activities and therefore would not cause additional impacts compared to existing conditions.

### **Preferred Alternative**

Under the Preferred Alternative, all project elements are far enough from the noise-sensitive land uses to avoid potential impacts.

### **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative is near the greatest number of noise-sensitive receivers. These include the Silver Cloud Inn, Losvar Condominiums, and four residential properties along Mukilteo Lane, Second Street, and Park Avenue.

The Silver Cloud Inn is the only receiver that is within a potential area of impact due to changes to roadways. Front Street would change to a one-way street in front of the property, but the extension of First Street would be beyond the potential area of impact for the hotel or any other noise-sensitive property. Model results indicate that during peak traffic periods, noise levels would reach 56 dBA, which is well below the 66 dBA threshold where impacts to noise-sensitive properties would occur. Similarly, the sound levels at the hotel, condominiums, and residential properties near the transit center or other new noise sources were anticipated to reach 55, 52, and 51 dBA, respectively, all below the noise impact threshold.

### **Elliot Point 1 Alternative**

Under the Elliot Point 1 Alternative, all project elements are far enough from the noise-sensitive land uses to avoid potential impacts.

## **4.3.4 Construction Impacts**

### **No-Build Alternative**

Even under the No-Build Alternative, the activities to maintain existing operations at the site would include construction of a replacement slip and terminal buildings and ongoing maintenance activities for the existing ferry terminal. Temporary, short-term impacts from construction noise, such as pile driving and demolition associated with the replacement of the terminal buildings and slip, would result from these activities. Pedestrians passing by and individuals working near the construction activity would be most affected.

No existing nearby structures would be damaged by construction of the No-Build Alternative and construction vibration would not exceed the federal impact criteria established by FTA. A general assessment of construction vibration effects on the NOAA Mukilteo Research Station indicates that the facility would experience vibration levels below the lowest FTA damage criteria for structures. FTA guidance suggests that facilities with laboratory equipment, such as optical microscopes and microbalances, can be evaluated by conducting a general assessment for the effects of vibration on these types of facilities. WSDOT conducted a general assessment for the NOAA facility and found the potential for some construction activity vibrations

to exceed the Category 1 (65) VdB threshold, which would apply to activities using microscopes or other specialized equipment.

### **Construction Impacts Common to All Build Alternatives**

WSDOT anticipates that all of the Build alternatives would require approximately 2 years to construct. Major construction elements include demolition, earth moving, hauling, grading, paving, pile driving, pier construction, building construction, and road construction. General construction noise and vibration impacts could be expected during all of these construction elements, but would be most pronounced during demolition, pile driving, and road construction.

### **Preferred Alternative**

As with the No-Build Alternative, no existing nearby structures would be damaged and noise or vibration levels would not exceed the federal annoyance criteria. Although additional demolition and construction activities would occur on the Mukilteo Tank Farm, the closest noise- and vibration-sensitive receivers are located near the existing terminal. Construction noise could be annoying for passersby and individuals working near the construction, but it would not disrupt normal activities.

With the Preferred Alternative, the potential for impacts on the NOAA Mukilteo Research Station would be less than the Existing Site Improvements Alternatives because construction of the ferry terminal, access road, and holding area would be located farther away from the NOAA facility; it would also be less than No-Build's construction impacts. However, demolition activities would still occur at the existing terminal site, and there would be the potential for some construction activity vibrations to exceed the Category 1 (65) VdB threshold, with the potential to affect sensitive equipment at NOAA.

### **Existing Site Improvements Alternative**

Under the Existing Site Improvements Alternative, the Losvar Condominium and Silver Cloud Inn residents and guests would likely experience greater noise and vibration annoyance than other area residents due to their proximity to the project site. As with the No-Build Alternative, no existing nearby structures would be damaged nor would noise or vibration levels exceed the federal impact criteria. More construction activity would occur near the NOAA research facility compared to the No-Build Alternative; therefore, there would be a greater potential for construction vibration to affect laboratory experiments conducted at the NOAA Mukilteo Research Station.

### **Elliot Point 1 Alternative**

The Elliot Point 1 Alternative would have impacts similar to those described above for the Preferred Alternative.

### **4.3.5 Indirect and Secondary Impacts**

Indirect or secondary impacts are caused by the proposed action that occur later in time or farther removed in distance but are still reasonably foreseeable. Indirect

impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density, or population growth rate. Because this project would not substantially increase the capacity of any of the current facilities, no indirect impacts are reasonably foreseeable for the currently proposed alternatives.

#### **4.3.6 Cumulative Impacts**

The Mukilteo downtown and waterfront areas were settled and developed before the advent of the automobile and other noise sources such as the BNSF railroad corridor, Paine Field, and the Mukilteo ferry terminal. After World War II, population growth in the central Puget Sound region accelerated, leading to increased commercial development and roadway traffic. In 1952, the Mukilteo Ferry terminal began operation. In the 1960s, I-5 was built, leading to increased traffic on SR 525. This combination of increased population, development, and roadway traffic have contributed to greater sources of noise in the Mukilteo downtown and waterfront areas than existed historically.

The noise modeling and analysis considers the long-term cumulative impacts of noise from existing noise sources, including freight and passenger rail, and all traffic forecasted within the study area. This includes traffic growth from the Mukilteo Station, the Mount Baker Terminal, and potential residential and commercial development on remaining portions of the Mukilteo Tank Farm and in the downtown core. The baseline also includes growth in rail traffic along the BNSF railroad corridor.

Transportation is one of the primary noise sources in the project area; therefore, the likely cumulative change to noise levels is already considered. While future development could introduce new noise-sensitive uses as well as other noise sources, no specific projects have been permitted at this time. NOAA's planned expansion would be a source of noise, but would not affect sensitive properties. Given the lack of significant impacts on existing noise-sensitive properties, long-term noise levels at new properties would likely be similar to baseline conditions. Construction of other projects, including NOAA's planned redevelopment, could introduce additional construction noise. If the projects occur concurrently, this additional noise could result in a temporary cumulative noise impact.

#### **4.3.7 Mitigation Measures**

Noise abatement and minimization measures have been designed into all alternatives. The abatement and minimization measures for long-term impacts, construction impacts, indirect impacts, and cumulative impacts are described in the following subsections.

##### **Mitigation for Long-Term Impacts**

Noise and vibration effects of the four alternatives were analyzed, as discussed in *Section 4.3.3*. None of the project alternatives anticipate noise or vibration effects that would cause impacts that require abatement.

## **Mitigation for Construction Impacts**

For all alternatives, including the Preferred Alternative, activities that generate high noise levels, such as demolition activities and pile driving, would follow a pre-approved schedule as defined by construction permits required by the City of Mukilteo to limit the noise effects of the construction activity on the nearby residential community on the bluff south of the project site. For example, the contractor would be required by the Washington Administrative Code and Mukilteo Municipal Code to restrict noise-generating construction activities to daylight hours or obtain a variance from the City of Mukilteo.

To minimize the duration of high noise levels, construction activities would be staged to occur simultaneously, if possible. The total noise level of the activities together would not be substantially greater, or more noticeable, than the largest of the noise levels generated by each of the single noise events.

Construction noise could be minimized by several means, including the use of effective vehicle mufflers, engine intake silencers, and engine enclosures; shutting off equipment when not in use; locating activities away from noise-sensitive receivers when possible; placing portable noise barriers around stationary equipment, such as a concrete crushing plant; and reducing the use of specific equipment, such as jack hammers, by using hydraulic tools instead.

The impacts of construction vibration at the NOAA Mukilteo Research Station would be minimized by means of preconstruction coordination and notification, as would be defined in construction permits required by the City of Mukilteo, and as defined through pre-construction coordination plans to be developed with NOAA. This would include:

- Using static rollers instead of vibratory rollers, when feasible
- Coordinating and scheduling any vibratory rolling or impact pile-driving activities with the NOAA facility to minimize interruption
- Monitoring the foundation vibration at the NOAA facility during vibratory rolling or impact driving within 500 feet to avoid exceeding the Institute of Environmental Science (IES) criteria for laboratory equipment
- As final design and construction plans are completed, coordinating with NOAA to identify any other potential vibration-sensitive activities or research that could occur during the construction period, and identifying measures to address disruption or interference with research activities

## **Mitigation for Indirect and Secondary Impacts**

Because no indirect or secondary noise and vibration impacts are reasonably foreseeable, no mitigation of indirect noise and vibration impacts would be necessary.

## **Mitigation for Cumulative Impacts**

Coordination of concurrent construction activities, such as NOAA's planned redevelopment or other City of Mukilteo or Sound Transit projects that occur within the same timeframe, would reduce potential cumulative noise impacts.

## **4.4 Visual Quality, Aesthetics, and Light and Glare**

Visual perception and experience is an important component of environmental quality. Because of the public nature and visual importance of the Mukilteo Multimodal Project, changes to the visual environment are being addressed during project development as part of the EIS.

### **4.4.1 Overview of Analysis**

This section examines the potential effects of the project alternatives on visual resources in the project area, as required under NEPA and SEPA.

The proposed alternatives are located primarily within the City of Mukilteo's land use planning jurisdiction, with a small portion to the east within the Everett city limits. Both jurisdictions have policies related to visual and aesthetic quality in their comprehensive plans, SMP, and permit review criteria.

### **Methods for the Visual Quality Assessment**

The assessment of visual quality, or aesthetics, is concerned with both the character of the visual experience and the effect upon the viewer. (For the purposes of this analysis, visual quality and aesthetics are analogous terms.) It is subjective in that the person perceiving the visual environment brings personal and cultural frames of reference to the discernment and evaluation of visual information. Still, regulations and research establish a general public consensus of what constitutes a desirable visual environment.

For this analysis, the visual or aesthetic experience includes three critical parameters:

- Visual character
- Visual quality
- Viewer response

Visual character refers to identifiable visual information. It may be distinguished both at the level of specific elements and at the level of the relationships among elements.

Visual quality refers to the value of the visual experience to the public. Vividness refers to the way landscape components combine in distinctive and memorable visual patterns.

Intactness refers to the integrity of natural and human-built visual patterns, and the extent to which the scene "hangs together." It also includes the extent to which the landscape is free from encroaching elements.

Viewer response is analyzed in terms of exposure and sensitivity. Viewer exposure refers to the physical location of viewer groups, the number of people exposed to a view, and the duration of their view. Viewer sensitivity refers to the degree in which a viewer perceives elements of the environment and the extent to which those elements are important to the viewer. This perception is affected by factors such as the activities a viewer is engaged in; the visual context; and the values, expectations, and interests of a group of persons or a person involved in a particular activity or context.

Viewpoints for this analysis were selected on the basis of:

- A substantial number of viewers
- Features that are representative of the existing conditions
- Views with high visual quality

Photographs were taken from viewpoints and reproduced at a scale that shows the static field of view an observer would see standing at the site. These photographs provide an accurate representation of the scale of elements of the view in relation to other objects. They do not, however, reproduce the entire field of view perceived by a human observer.

#### **4.4.2 Affected Environment**

The Mukilteo Multimodal Project area is located in the northernmost part of the city of Mukilteo adjacent to the city of Everett. The area of the alternatives is an east-west-oriented portion of the Possession Sound shoreline. In Everett, the shoreline continues generally northward.

Major land uses along the shoreline include the Mukilteo Lighthouse Park at the west end of the point, which includes a boat launch and 6.6 acres of parking, as well as the lighthouse, a volleyball court, and picnic tables. A condominium development, a restaurant, and a hotel are between the lighthouse and Park Avenue. To the west of SR 525, the ferry holding area covers most of the street frontage to Park Avenue. NOAA Fisheries operates the Mukilteo Research Station on 1.1 acres east of Park Avenue. The Mukilteo Tank Farm extends about 3,200 feet along the shoreline east of Park Avenue. It consists largely of partially demolished storage tanks, a variety of support facilities in various stages of deterioration, and a 1,300-foot-long unused pier. The Mount Baker Terminal occupies a 1.5-acre site east of the Mukilteo Tank Farm.

The BNSF railroad generally forms the boundary between flat land to the north and a steep bluff to the south. Sound Transit's Mukilteo Station, east of Park Avenue, includes platforms and parking.

South of the BNSF railroad, land uses are primarily single-family residential areas west of SR 525 and east of Park Avenue. A commercial area extends between the BNSF tracks and Third Street bounded by SR 525 on the west and Park Avenue on the east.

The areas described below were identified to best represent and analyze the affected environment. Viewpoints were selected from these areas (Figure 4.4-1):

- The Puget Sound/Possession Sound shoreline. This area generally accommodates views parallel to the shoreline. Four viewpoints were chosen from this area.
- The flat upland area between the shoreline and the BNSF right-of-way. Only one viewpoint was selected from this area because the topography and buildings along the shoreline do not offer views of significant features of the alternatives.
- The bluff immediately south of the BNSF tracks. Four viewpoints were chosen from this area.

Selected viewpoints are as follows, and are shown in *Section 4.4.8*.

**Viewpoint 1, View East from Mukilteo Lighthouse.** This shoreline viewpoint (Figure 4.4-2) is located just north of the lighthouse and outside of the concrete seawall at the end of a pedestrian walkway. This viewpoint faces east and includes the existing ferry terminal as a major foreground element. In the distance, the peaks of the Glacier Peak Wilderness Area in the North Cascades are the most vivid feature on clear days. The terminal facilities partly obscure views of the city of Everett and Port Gardner. The activity of ferries landing, loading, and departing, however, provide visual interest in themselves.

The ferry terminal is the major source of light in this area. There is also some exterior lighting on the condominium building and buildings east of the terminal.

The viewing population from this area consists of park users and beach users. This population is larger in the summer, but continues year-round. Viewers can be considered sensitive to the visual context; however, they have a wide range of potential views to choose from. They can look away from the ferry terminal to enjoy natural views or they can look toward the terminal.

**Viewpoint 2, View West from Silver Cloud Inn Shoreline Public Access.** This viewpoint (Figure 4.4-3) is located just east of the existing ferry terminal from a public access walkway between Ivar's restaurant and the Silver Cloud Inn. The view is to the west along the orientation of the shoreline, and includes the existing ferry terminal as a major foreground element framed by Ivar's restaurant to the south. In the distance, above the terminal, the Olympic Mountains are the most vivid feature on clear days but are substantially obscured by the terminal facilities, particularly when a ferry is docked. The man-made features of the ferry terminal are the dominant elements of the view, and the natural features of mountains and water are minor elements. The terminal is an encroaching element in distant view, but also provides a near-view focus of maritime activity. The ferries, with the landing, loading, and departing activities, provide visual interest.

The ferry terminal is a major source of light at night, and there is some exterior lighting on buildings. Viewers are mostly persons enjoying the public access area that parallels the shoreline.



- Project Area
- - - Shoreline
- . - Upland
- Bluff

Figure 4.4-1. Viewpoints

**Viewpoint 3, View East from Silver Cloud Inn Shoreline Public Access.** This viewpoint (Figure 4.4-4) is from the public access pier between Ivar's restaurant and the Silver Cloud Inn. The view faces east along the shoreline, and is about 100 feet north of Viewpoint 2. The distant views are dominated by the peaks of the Glacier Peak Wilderness Area in the North Cascades on clear days. The extensive water areas of Possession Sound and Port Gardner Bay provide an additional area of visual interest visible in all weather conditions. The dominant features in the near and middle distance are the NOAA pier and Tank Farm Pier at the Mukilteo Tank Farm. The two piers do not obscure distant views of the mountains because those structures are well below the line of sight. They do, however, obscure distant shoreline features of the city of Everett and Port Gardner. The pier and the Mukilteo Tank Farm are encroaching elements that reduce the integrity and unity of near to middle-distance views.

There is relatively little exterior lighting in the immediate vicinity. The Silver Cloud Inn and NOAA Mukilteo Research Station have exterior security lights, but there are no urban street lights visible. There is little lighting on the Mukilteo Tank Farm. Mount Baker Terminal is a more distant source of light at night.

Viewers are mostly persons enjoying the public access area that parallels the shoreline.

**Viewpoint 4, View West from Mount Baker Terminal Shoreline Access Area.** This viewpoint (Figure 4.4-5) is located just west of the Mount Baker Terminal within a shoreline access area that includes a beach to the east and picnic areas. The view is from the beach area, to the west along the shoreline. It is dominated by the Olympic Mountains on clear days. On days when vision is obscured, the most extensive horizon feature is the wooded ridgeline of Whidbey Island. The extensive water areas of Possession Sound provide an area of interest both as a natural feature and as the context for a variety of human activities on the water ranging from commercial shipping to recreational boating. Distant views of the mountains are not obscured by the Tank Farm Pier in the middle distance because it is well below the line of sight. The pier does, however, substantially obscure views of the existing ferry terminal. The shoreline features of the Mukilteo Tank Farm at a middle distance are a disorganized assemblage of partially demolished facilities that reduce the integrity and unity of this portion of the view.

There is relatively little urban street lighting in the immediate vicinity. Lights of the downtown area west of Park Avenue and from the ferry terminal are visible in the distance. There is little lighting on the Mukilteo Tank Farm.

The viewing population from this area is relatively small because the site does not currently have vehicular access or local public access, but access is intended for future public use. The future viewing population will be sensitive to the visual context, but they have a wide range of potential views to choose from.

**Viewpoint 5, North View from Ferry Terminal Vehicle Holding Area.** This viewpoint (Figure 4.4-6) is located in the southerly portion of the ferry holding area. The view is oriented to the north. A slope to the north provides views of buildings along Front Street above the vehicles. Views of the ferry at the dock are limited by the angle of the dock and the existing towers. There are partial views of the water and the

wooded ridge of Whidbey Island between buildings. The dominant features of the view are buildings along Front Street. The view has no vivid dominating features. It has some unity in the character of building fronts. The vehicles parked in the ferry holding area may be viewed as an encroaching element that reduces visual unity.

There is currently a wide variety of urban street lighting and building lights in the area, with the lighting at the ferry holding area a major source of nighttime light.

Most viewers are occupants of vehicles waiting for the ferry. For them, the vehicles parked in front of them will obscure much of the view. This viewing population is less likely to be sensitive to the view while waiting in their vehicles. Viewers that exit vehicles are likely to have a range of sensitivity to the view depending on their activities.

**Viewpoint 6, North View from SR 525.** This viewpoint (Figure 4.4-7) is located on the east side of SR 525 at the mid-point of the overpass crossing the BNSF tracks. Oriented to the north, it includes the entry to the existing holding area; it is typical of views from locations east along Second Street. This is also the view experienced by occupants of vehicles accessing the ferry or vehicles queued along the shoulder of the highway. The termination of the view includes the waters of Possession Sound and the wooded ridgeline of Whidbey Island, which can be viewed in corridors between buildings and over shorter buildings along Front Street. The view lacks vivid elements and has a moderate level of visual quality. The existing ferry terminal is largely out of the field of view because of the angle of the dock at the end of the roadway and the blockage by the Losvar Condominium building.

There is a wide variety of urban street lighting in the area, with the lighting at the ferry holding area a major source of nighttime light.

The viewing population from this area is largely occupants of vehicles waiting for the ferry, pedestrians along the highway, and pedestrians along Second Street. This viewing population is likely to have a range of sensitivity to the view depending on activities.

**Viewpoint 7, Northwest View from Second Street and Park Avenue.** This viewpoint (Figure 4.4-8) is located on Second Street east of Park Avenue and is south of the BNSF tracks. The existing ferry holding area is in the middle of the view but north of the BNSF tracks, and is largely obscured by an existing two-story building at First Street and Park Avenue. Elements in the view range from parked cars to buildings to overhead utility lines. Views of the waters of Possession Sound and the wooded ridgeline of Whidbey Island are largely obscured by intervening buildings. The view lacks vivid elements, and has a number of elements with little compositional unity; therefore, it has a low to moderate level of visual quality.

There is a wide variety of urban street lighting in the area; the lighting at the ferry holding area is a major source of nighttime light. Because this viewpoint is above the elevation of light standards in the holding area, it experiences limited direct glare.

The viewing population from this area is largely occupants of vehicles, pedestrians along city streets, and residences located above the BNSF tracks. This viewing population is likely to have a range of sensitivity to the view depending on activities, with residents likely to be the most sensitive.

**Viewpoint 8, North View from Second Street and Prospect Avenue.** This viewpoint (Figure 4.4-9) is located on a private lane north of Second Street and is typical of views from residences and some public street corridors on the bluff south of the BNSF tracks. The view has two components: the highly integrated and unified distant view of Possession Sound, and the highly disorganized middle to near view of the partially demolished Mukilteo Tank Farm. The major element in the distant view is the water area of Possession Sound centered on the wooded ridgeline of Hat Island with Camano Island in the background. The overall distant views are an integrated scene of water and islands with native vegetation predominating over man-made structures.

In the middle and near view, the Mukilteo Tank Farm is a prominent element, at variance with the character of the natural water and land views. The partially disassembled structures also contribute to the lack of integration and visual unity. It is likely that most residents are habituated to the dissonant elements of the view and concentrate on the high visual quality of distant views.

There is currently little or no exterior lighting visible from this viewpoint within the Mukilteo Tank Farm or in the distance.

The viewing population from this area is largely residents and includes some pedestrians along city streets who can access views between buildings or down street corridors at Prospect and Cornelia Streets and down Brewery Creek. The predominantly residential viewing population is likely to be very sensitive to visual quality.

**Viewpoint 9, Northwest View from Mukilteo Lane East of Japanese Gulch.** This viewpoint (Figure 4.4-10) is located on Mukilteo Lane just before it turns south away from the shoreline. The view has two components: the highly integrated and unified distant view of Puget Sound, Possession Sound, and the Olympic Mountains; and the highly disorganized middle to near view of the partially demolished Mukilteo Tank Farm. As with Viewpoint 8, it is likely that most residents are habituated to the dissonant elements of the view and concentrate on the high visual quality of distant views. The Mukilteo Tank Farm, however, is much more visible as a long linear feature in this view. The combination of the two elements results in a high level of visual interest and a moderate level of visual integrity and unity.

There is currently little or no exterior lighting visible from this viewpoint within the Mukilteo Tank Farm. Exterior lighting at the existing ferry terminal is visible in the distance.

The viewing population from this area includes vehicle occupants and pedestrians along Mukilteo Lane and residents of homes on the bluff. The residential viewing population is likely to be very sensitive to visual quality.

### **4.4.3 Long-Term Environmental Impacts**

#### ***No-Build Alternative***

The No-Build Alternative includes what would be needed to maintain the existing ferry terminal at a functional level. It assumes that maintenance and structure

replacements would occur in accordance with legislative direction to maintain and preserve ferry facilities. There would be no investments to improve the operation, safety, security, or capacity at the terminal.

Therefore, no visual impacts or benefits would be expected for the No-Build Alternative.

### **Preferred Alternative**

This alternative would relocate the ferry terminal from its current location to the western portion of the Mukilteo Tank Farm, just east of the NOAA Mukilteo Research Station.

WSDOT refined the design of the Elliot Point 2 Alternative to create the Preferred Alternative. The design refinements were generally neutral or beneficial to the alternative's aesthetic impacts. Visual changes due to this alternative were simulated for several viewpoints. Table 4.4-1 summarizes the effects.

**Table 4.4-1. Preferred Alternative Visual Impacts**

<b>Viewpoint</b>	<b>Impact</b>
1. View East from the Mukilteo Lighthouse (see Figure 4.4-2)	<p>Removing the existing terminal, ferry berth and fishing pier/day moorage would provide greater integration and unity of the distant peaks of the Glacier Peak Wilderness Area and also would open up the middle distance shoreline views of Port Gardner. The NOAA pier, however, would continue to partially obscure these features. The new over-water terminal facilities to the east would be visible, but would be at a substantially greater distance and would be partially obscured by the NOAA pier. The viewing population would likely consider the view as being more integrated with the views to the west and north in which the natural features predominate.</p> <p>The elimination of the ferry terminal as the major source of light in this area would change the nighttime visual character somewhat, but substantial urban light would continue to be present from existing shoreline development.</p>
2. View West from Silver Cloud Inn Shoreline Public Access (see Figure 4.4-3)	<p>Removing the existing ferry terminal and the fishing pier/day moorage facility would allow a more open and integrated view of natural features, including the waters of Possession Sound and Puget Sound with the peaks of the Olympic Mountains. The view would increase significantly in integrity and unity. Viewers would perceive the view as one in which natural elements predominate.</p>
3. View East from Silver Cloud Inn Shoreline Public Access (see Figure 4.4-4)	<p>Removing the Tank Farm Pier would tie together the distant views dominated by mountains and the near and middle distance views of water areas of Possession Sound and Port Gardner Bay. Views of the ferry berth would be partially obscured by the NOAA pier; however, the overhead facilities including towers housing the hydraulic transfer span lifting mechanisms, the overhead walkways, and the two-story passenger building would be higher than the existing Tank Farm Pier and would be relatively prominent.</p> <p>Lighting for ferry facilities, parking, and transit centers would increase substantially. This source of light, however, is at a moderate distance from the viewpoint and therefore it is likely to be perceived as a generalized area of bright lighting rather than a source of glare.</p>

**Table 4.4-1. Preferred Alternative Visual Impacts**

<b>Viewpoint</b>	<b>Impact</b>
4. View West from Mount Baker Terminal Shoreline Access Area (see Figure 4.4-5)	<p>The ferry facility towers for the transfer span, the overhead walkways, and the two-story passenger building would be higher than the existing Tank Farm Pier, but would not be high enough to encroach on the most vivid feature in the view, which are the peaks of the Olympic Mountains, particularly when a ferry vessel is docked. The ferry holding area would have greater visual unity than the remains of the Mukilteo Tank Farm.</p> <p>The over-water structure would be a prominent visual focus at night that would be more visually arresting than other features in the vicinity. A fishing pier would be partially visible in the foreground but less prominent than the overwater structures.</p>
5. North View from Ferry Terminal Vehicle Holding Area (see Figure 4.4-6)	Removing the ferry terminal would clear the corridor between the condominium and Ivar's restaurant. It would also remove a source of nighttime lighting.
6. North View from SR 525 (see Figure 4.4-7)	<p>The ferry terminal would be removed and an unobstructed view down the highway corridor would be available of Possession Sound and Whidbey Island. The viewing population is likely to perceive the view as more integrated.</p> <p>The lighting would be less intense than the current lighting in the ferry holding area.</p>
7. Northwest View from Second Street and Park Avenue (see Figure 4.4-8)	<p>The integrity and unity of distant views of Possession Sound and Whidbey Island would be increased by removal of a building currently blocking these views.</p> <p>The lighting would be less intense than the current lighting in the ferry holding area.</p>
8. North View from Second Street and Prospect Avenue (see Figure 4.4-9)	<p>The terminal building facilities would have no impact on distant views of Possession Sound and the islands in the distance. In the middle to near distance, terminal facilities, particularly towers for the transfer span, the overhead walkways, and the two-story passenger building would be higher than the existing pier and more prominent. The terminal would be at a much smaller scale than the Tank Farm Pier and perpendicular to the view rather than cutting across the view. These features would result in a greater visual integrity and unity than the assemblage of existing Mukilteo Tank Farm elements, including remnants of the large storage tanks.</p> <p>Holding and parking areas for vehicles, however, would lack visual interest. Overall, the lack of impact on high-quality distant views and the increased visual unity of near views, despite low visual interest, would moderately increase the level of visual integrity, unity, and overall visual quality.</p> <p>There would be more lighting than currently exists on the Mukilteo Tank Farm; at night, viewers from the bluff above the site would have a brightly lit area in the foreground views, which would also reduce visibility for longer range night views.</p>
9. Northwest View from Mukilteo Lane East of Japanese Gulch (see Figure 4.4-10)	<p>The terminal facilities would have no impact on the most vivid feature in daytime distant views, which are the peaks of the Olympic Mountains, because terminal facilities are well below these features. Overall, the terminal would have greater visual integrity and unity than the existing Mukilteo Tank Farm elements, which includes a degraded landscape with remnant tanks, structures, and buildings in various states of repair. However, near views of the Mukilteo Tank Farm would not be altered.</p> <p>The lighting for ferry facilities would increase ambient light levels, as discussed for Viewpoint 8 above, but the lighting is at a greater distance and would be less of an intrusion.</p>

### **Existing Site Improvements Alternative**

This alternative would reconstruct the terminal and its related facilities at the current site, which would be expanded and realigned, as well as increasing the height of structures on the waterfront. To indicate the visual impacts of this alternative, visual simulations were prepared for several views; impacts are summarized in Table 4.4-2.

**Table 4.4-2. Existing Site Improvements Alternative Visual Impacts**

<b>Viewpoint</b>	<b>Impact</b>
1. View East from the Mukilteo Lighthouse (see Figure 4.4-2)	The terminal's configuration is similar to the existing one, with the addition of the overhead loading structure. This would increase the view blockage directly east toward Everett, the waterfront, and the distant vivid peaks of the Glacier Peak Wilderness Area. Residents would also have increased view blockage.
2. View West from Silver Cloud Inn Shoreline Public Access (see Figure 4.4-3)	The terminal's configuration is similar to the existing one, but with the addition of the overhead loading structure. The middle distance views of Possession Sound and Puget Sound, including the distant vivid peaks of the Olympic Mountains, and views for the public on the shoreline access pier would be further encroached upon. Silver Cloud Inn patrons would also have increased view blockage.
3. View East from the Silver Cloud Inn Shoreline Public Access (see Figure 4.4-4)	There would be no change in visual character or visual quality; the viewpoint faces away from the existing ferry terminal or the replacement terminal.
4. View West from the Mount Baker Terminal Shoreline Access Area (see Figure 4.4-5)	Little change in visual character or visual quality because the changes would be in the distance.
5. North View from Ferry Terminal Vehicle Holding Area (see Figure 4.4-6)	Replacing Ivar's restaurant with a two-story passenger terminal and the overhead loading ramp would further obstruct parts of the view.
6. North View from SR 525 (see Figure 4.4-7)	Replacing Ivar's restaurant with a two-story passenger terminal and the overhead loading ramp would further obstruct parts of the view. The ferry, while at dock, would be more visible because the new facilities would be aligned with SR 525.
7. Northwest View from Second Street and Park Avenue (see Figure 4.4-8)	<p>The ferry holding area and the bus transit center would become somewhat more visible because of the removal of an existing building that currently blocks views; this would result in a reduction in visual quality.</p> <p>The lighted holding area and the bus transit center would likely become the dominant feature of views at night because other water and landscape elements have lower-intensity lighting.</p> <p>For the viewing population, the expansion of the parking area as the center of attention may be regarded as a negative distraction and a reduction in visual quality. Condominium residents are likely to perceive the additional nighttime lighting as an impact because of its proximity.</p>
8. North View from Second Street and Prospect Avenue (see Figure 4.4-9)	No change in visual character or visual quality; viewpoint faces away from the existing ferry terminal.
9. Northwest View from Mukilteo Lane East of Japanese Gulch (see Figure 4.4-10)	Little change in visual character or visual quality is expected; most changes occur within distance views with features not readily distinguished.

### ***Elliot Point 1 Alternative***

This alternative would relocate the ferry terminal from its current location to the eastern portion of the Mukilteo Tank Farm, thereby removing the current facility's visual elements, and introducing new visual elements to another location on the waterfront. To indicate the visual impacts of this alternative, visual simulations were prepared for several views; impacts are summarized in Table 4.4-3.

**Table 4.4-3. Elliot Point 1 Alternative Visual Impacts**

<b>Viewpoint</b>	<b>Impact</b>
1. View East from the Mukilteo Lighthouse (see Figure 4.4-2)	Impacts would be similar and slightly less than those discussed above for the Preferred Alternative because the facility would be a more distant element of the view. Impacts would be positive because of the elimination of the existing terminal.
2. View West from Silver Cloud Inn Shoreline Public Access (see Figure 4.4-3)	Visual conditions would be similar to those discussed above for the Preferred Alternative. The changes would be positive because of the elimination of the existing terminal and the existing fishing pier/day moorage.
3. View East from Silver Cloud Inn Shoreline Public Access (see Figure 4.4-4)	Impacts would be similar and slightly less than those discussed above for the Preferred Alternative because the facility would be a more distant element of the view.
4. View West from Mount Baker Terminal Shoreline Access Area (see Figure 4.4-5)	Impacts would be similar and slightly more prominent than those discussed above for the Preferred Alternative because the facility would be nearer to the viewpoint. The clutter represented by the eastern portion of the Mukilteo Tank Farm would be removed, which would improve visual integrity and unity.
5. North View from Ferry Terminal Vehicle Holding Area (see Figure 4.4-6)	Impacts would be similar to those discussed above for the Preferred Alternative.
6. North View from SR 525 (see Figure 4.4-7)	Impacts would be similar to those discussed above for the Preferred Alternative.
7. Northwest View from Second Street and Park Avenue (see Figure 4.4-8)	Impacts would be similar to those discussed above for the Preferred Alternative.
8. North View from Second Street and Prospect Avenue (see Figure 4.4-9)	Impacts would be similar to those discussed above for the Preferred Alternative, except that the clutter in the western portion of the Mukilteo Tank Farm that would not be redeveloped and would remain partially in the view.
9. Northwest View from Mukilteo Lane East of Japanese Gulch (see Figure 4.4-10)	Impacts would be similar to those discussed above for the Preferred Alternative, except that the clutter in the eastern portion of the Mukilteo Tank Farm would be replaced by vehicle holding lanes closer to the viewpoint, which would improve visual integrity and unity.

#### 4.4.4 Construction Impacts

The construction impacts on visual quality would be temporary for all alternatives and at all viewpoints. Impacts would result from activities related to staging areas, lighting, fencing, closed roadway sections, detours, heavy equipment, scaffolding, cranes, and temporary storage of materials, including demolition debris. The visual impacts of construction would generally not change the overall views available, but would alter existing localized views. The most prominent elements that would alter views would likely be cranes and other tall equipment. However, distant views of water features and mountains would remain visible if partially obstructed.

#### 4.4.5 Indirect and Secondary Impacts

Visual changes could occur due to changes in development and landscaping for other projects. For example, the development of part of the tank farm could allow other developments to occur on unused portions of the site. The visual impacts of potential

other developments likely would be a positive change from the current views of remnant tanks on the Mukilteo Tank Farm site. A shift from the existing terminal location to the tank farm property would also make the lands that are currently used for the terminal available for other developments. Any other developments would be subject to separate development review processes, but they could involve more visually prominent structures or features than exist today. For example, the City of Mukilteo is considering a parking facility in the waterfront area to help serve commuter rail and other parking needs, and some of the potential site options are on the Mukilteo Tank Farm site.

#### **4.4.6 Cumulative Impacts**

The visual character of the landscape has been dramatically transforming ever since the first Europeans settled in the area. The area was logged and cleared for farming and development; shoreline areas were filled; rivers were channelized; and other activities such as shoreline development and road building all contributed to changes in the landscape. The urban character of the project area has also changed over time as the architecture of the city has evolved and land uses have changed. Even though development has blocked some views of the landscape, Mukilteo benefits from many natural features such as the Olympic and Cascade Mountains, which are so dominant that they can still be seen from many viewpoints.

Foreseeable future actions include redevelopment of the Mukilteo Tank Farm, as discussed in *Section 4.2 Land Use and Economics*.

#### **No-Build Alternative**

This alternative would not affect the Mukilteo Tank Farm, so the entire parcel would be available for redevelopment under Mukilteo and Everett land use regulations. Cumulative visual quality changes could occur in the area if redevelopment were to occur as the City of Mukilteo anticipates. The City's goal for redevelopment is to create a prime Snohomish County attraction and provide recreational opportunities for residents and visitors; specifically, these would include a walking promenade along the shoreline, access to the waterfront, and linkages to parks and open spaces. In general, the visual effects of such redevelopment would be positive because it would replace the partially demolished remains of the Mukilteo Tank Farm with low-rise urban development, which would have a more unified and integrated visual character. Lighting would consist of normal building and street lighting. This lighting would be a change in the nighttime environment from viewpoints where the site can be seen, but would be substantially less than the lighting required for the Mukilteo ferry terminal.

NOAA plans to expand its laboratory on the west end of the Mukilteo Tank Farm. If this expansion occurs, the scale of buildings is likely to be similar to private-sector, mixed-use development in terms of height and bulk, as well as lighting.

The anticipated relocation of the City of Mukilteo boat launch ramp currently at Lighthouse Park could be accommodated at a variety of sites on the Mukilteo Tank Farm. This would involve a ramp and pier that would likely be visible only from a close range. The parking for the launch ramp could cover several acres and be similar in character to the ferry holding area and other parking. If the parking area were

lighted, the intensity of lighting likely would be less than the ferry holding area because the operational needs are different.

Sound Transit and the City of Mukilteo are studying options for expanding parking, but a specific site has not yet been confirmed. A multi-story structure would have additional visual quality impacts that would be apparent primarily from Viewpoint 9 and from single-family residences on the bluff behind the BNSF tracks between Viewpoints 7 and 9. Visual impacts of this project will be assessed separately in the future.

### ***Preferred Alternative***

Under this alternative, the eastern portion of the Mukilteo Tank Farm parcel could be available for redevelopment. The visual impacts of such redevelopment would be positive with a greater integrity and unity of design compared to the lack of visual integrity and unity from the partially disassembled structures of the Mukilteo Tank Farm.

Under this alternative, the existing ferry terminal would be removed and the site could be available for redevelopment. The scale of development and the associated impacts would be similar to the description above for the portions of the Mukilteo Tank Farm not used for the ferry terminal.

Lighting would consist of normal building and street lighting that would be substantially less than the lighting required for the ferry terminal.

The relocation of the boat launch at Lighthouse Park, expansion of the NOAA Mukilteo Research Station and possible replacement of its pier, and expansion of Mukilteo Station by Sound Transit, would have visual impacts similar to those discussed under the No-Build Alternative.

### ***Existing Site Improvements Alternative***

Cumulative impacts of mixed-use development on the Mukilteo Tank Farm, potentially in combination with relocation of the boat launch at Lighthouse Park, NOAA Mukilteo Research Station expansion, and Mukilteo Station expansion, would be similar to those discussed under the No-Build Alternative.

### ***Elliot Point 1 Alternative***

The impacts of mixed-use redevelopment and potential relocation of the boat launch ramp on the Mukilteo Tank Farm would be similar to those discussed above under the Preferred Alternative. The area of the Mukilteo Tank Farm potentially available for redevelopment is to the west and more easily integrated with the redevelopment area of the existing terminal site. The relocation of the boat launch at Lighthouse Park, expansion of the NOAA Mukilteo Research Station, and expansion of Mukilteo Station would have visual impacts similar to those discussed under the No-Build Alternative.

## 4.4.7 Mitigation Measures

### Mitigation for Long-Term Impacts

For the Preferred Alternative, mitigation measures would be applied to reduce potential visual impacts, including light and glare:

- Applying a context-sensitive design approach to soften view impacts of large expanses of paved area. To be reduce visual impacts from the south, landscaping would include native vegetation, such as trees with substantial canopy size, and landscaping would be considered for areas between ferry loading lanes and pedestrian-oriented areas, where feasible.
- Applying context-sensitive design treatments reflecting the site's cultural and historic significance; this could include historic and natural resource interpretive or design features.
- Using shorter supports for light standards to reduce glare impacts.
- Shielding luminaries on all lights to limit horizontal and vertical diffusion of glare.
- Continuing a culturally-sensitive design approach defined in the project's Section 106 Memorandum of Agreement to unite the site visually and with other public facilities. Cultural design elements could include traditional motifs and objects; narrative content; building and facility design, such as landscaping, materials, and form; commemorative signs, drawings, and photography; and public educational displays. Under the MOA, tribal representatives and WSDOT would collaboratively develop the design criteria for cultural elements.
- During final design, coordinating with the City of Mukilteo, Sound Transit, and others on design themes such as:
  - A common specification for terminal lighting that could be coordinated with other public projects and street lighting. The hue of the lighting also could be coordinated as appropriate for the surrounding streets.
  - Surface elements, such as sidewalks and crosswalk treatments, on the site and surrounding areas that provide visual unity. These also could be designed to reinforce way-finding by clearly demarcating pedestrian routes to the transit center, Mukilteo Station, and other destinations.

Other alternatives would apply similar measures as described for the Preferred Alternative, including similar programs for context-sensitive and culturally-sensitive designs.

## 4.4.8 Visual Simulations

Figures 4.4-2 to 4.4-10 show the current view and the simulated view for each of the project alternatives at the selected viewpoints.



Viewpoint 1

**Figure 4.4-2 (Existing)**  
**View East from the Mukilteo Lighthouse**



Viewpoint 1 - Preferred Alternative



Viewpoint 1 - Existing Site Improvements Alternative

**Figure 4.4-2 (Simulations)  
View East from the Mukilteo Lighthouse**



Viewpoint 2

**Figure 4.4-3 (Existing)  
View West from the Silver Cloud Inn  
Shoreline Public Access**



Viewpoint 2 - Preferred Alternative and Elliot Point 1 Alternative



Viewpoint 2 - Existing Site Improvements

**Figure 4.4-3 (Simulations)**  
**View West from the Silver Cloud Inn**  
**Shoreline Public Access**



Viewpoint 3

**Figure 4.4-4 (Existing)**  
**View East from the Silver Cloud Inn**  
**Shoreline Public Access**



Viewpoint 3 - Preferred Alternative



Viewpoint 3 - Elliot Point 1 Alternative

**Figure 4.4-4 (Simulations)  
View East from the Silver Cloud Inn  
Shoreline Public Access**



Viewpoint 4

**Figure 4.4-5 (Existing)**  
**View West from the Mount Baker Terminal**  
**Shoreline Access Area**



Viewpoint 4 - Preferred Alternative



Viewpoint 4 - Elliot Point 1 Alternative

**Figure 4.4-5 (Simulations)**  
**View West from the Mount Baker Terminal**  
**Shoreline Access Area**



Viewpoint 5

Figure 4.4-6 **(Existing)**  
North View from the Ferry Terminal  
Vehicle Holding Area



Viewpoint 5 - Preferred Alternative and Elliot Point 1 Alternative



Viewpoint 5 - Existing Site Improvements Alternative

**Figure 4.4-6 (Simulations)**  
**North View from the Ferry Terminal**  
**Vehicle Holding Area**



Viewpoint 6

**Figure 4.4-7 (Existing)**  
**North View from SR 525**



Viewpoint 6 - Preferred Alternative and Elliot Point 1 Alternative



Viewpoint 6 - Existing Site Improvements Alternative

**Figure 4.4-7 (Simulations)**  
**North View from SR 525**



Viewpoint 7

**Figure 4.4-8 (Existing)**  
**Northwest View from Second Street and Park Avenue**



Viewpoint 7 - Preferred Alternative and Elliot Point Alternative



Viewpoint 7 - Existing Site Improvements Alternative

**Figure 4.4-8 (Simulation)**  
**Northwest View from Second Street and Park Avenue**



Viewpoint 8

**Figure 4.4-9 (Existing)**  
**North View from Second Street and Prospect Avenue**



Viewpoint 8 - Preferred Alternative



Viewpoint 8 - Elliot Point 1 Alternative

Figure 4.4-9 (Simulations)  
North View from Second Street and Prospect Avenue



Viewpoint 9 - Existing View



Viewpoint 9 - Preferred Alternative

**Figure 4.4-10 (Existing and Simulation)**  
**Northwest View from Mukilteo Lane East of Japanese Gulch**



Viewpoint 9 - Existing Site Improvements Alternative



Viewpoint 9 - Elliot Point 1 Alternative

**Figure 4.4-10 (Simulations)**  
**Northwest View from Mukilteo Lane East of Japanese Gulch**

## 4.5 Social Environment and Environmental Justice

This section evaluates the project's potential for adverse impacts on and benefits to parks, recreation, social services, neighborhoods, community resources, and community cohesion. It also assesses the potential for disproportionately high and adverse impacts on low-income and minority communities.

### 4.5.1 Overview of Analysis and Regulatory Context

NEPA established a national environmental policy and goals for the protection, maintenance, and enhancement of the environment, which includes communities as well as parks and recreation areas. FTA's regulations for implementing NEPA provide guidance for considering impacts on the social environment. SEPA regulations suggest that general welfare, social, and economic factors be taken into account in an environmental review, but does not apply the term "socioeconomic" or define other requirements for the analysis of impacts on certain populations.

Pursuant to Title VI of the Civil Rights Act and the Civil Rights Restoration Act, recipients of federal financial assistance must ensure non-discrimination on the basis of race, color, or national origin in all of their programs and activities. Similarly, Executive Order 12898 (1994) requires federal agencies to analyze their actions and environmental impacts on minority and low-income populations.

Following Executive Order 12898, USDOT issued Order 5610.2, which describes how USDOT administrations must analyze environmental justice and incorporate environmental justice principles into the transportation decision-making process.

The analysis of parks and recreational impacts is required under both SEPA and NEPA; in addition, there are state and federal regulations regarding the potential conversion of park land for other purposes. Much like the other aspects of the social impact analysis, coordination and consultation with local agencies, non-profit service providers, and the public are critical to the analysis process.

### Analyzing Social Impacts

The social impacts section of this EIS examines how the project could alter the ways in which people live, work, play, and function together as members of society. This includes changes to the larger environment or physical setting for a community, which could affect the cohesion and functions of individual neighborhoods or community members, including people in minority or low-income groups. It also includes a review of the public park, recreation, and social services available to the community.

The community impact analysis flows out of the EIS's overall findings of other kinds of environmental impacts. It examines the findings for those and other environmental conditions to assess the potential for significant impacts on communities. The social impacts assessment considers:

- Displacements of homes, businesses, or community resources  
(see *Section 4.2 Land Use and Economics*)
- Separation of a neighborhood from its community resources  
(see *Chapter 3 Transportation*)

- Economic changes resulting from displacements, or other changes affecting local or regional economic activities (see *Section 4.2 Land Use and Economics*)
- Changes in the transportation system, parking, or traffic circulation patterns that affect the connectivity within a community or between communities, and altered connections between residential areas and the arterial and transit networks (see *Chapter 3 Transportation*)
- Permanent or temporary impacts that adversely affect the community, such as visual, noise and vibration, air quality, parks and recreational resources, and impacts on the local utilities, public services, or facilities (see *Sections 4.2 Land Use and Economics; 4.3 Noise and Vibration; 4.4 Visual Quality, Aesthetics, and Light and Glare; 4.7 Air Quality; and 4.13 Public Services and Utilities*)
- Health and resource impacts related to hazardous materials (see *Section 4.8 Hazardous Materials*)

### Analyzing Environmental Justice Impacts

The analysis identifies the percentages of low-income and minority populations in the study area that could experience impacts from the project. These percentages are compared to the average percentage of low-income and minority populations at city and county levels. The study area extends 0.5 mile from the footprint of the alternatives, and is based on an assessment of potential project impacts from all alternatives in other environmental impact topics. The analysis also takes into consideration the potential for environmental justice impacts based on all impacts identified in the EIS, not just the impacts in the environmental justice study area.

As described in *Section 4.5.2 Affected Environment*, this Final EIS has applied data from the 2010 U.S. Census and from the 2006-2010 American Community Survey; the Draft EIS used 2000 Census data. Consistent with the Draft EIS, the Final EIS data are reported for the census tracts that overlap with the study area boundaries. The 2010 U.S. Census revised boundaries for one of the two study area census tracts. As a result, the Final EIS analyzes the demographics of a smaller total population than shown in the Draft EIS.

The analysis also considers information collected from other sources, including Section 8 Housing Assistance data from the U.S. Department of Housing and Urban Development (HUD), as well as free and subsidized lunch program data from the Mukilteo School District.

USDOT guidance defines “low-income households” using the U.S. Department of Health and Human Services poverty guidelines. The U.S. Census Bureau defines “minority” to include the following racial categories:

- **Black or African American.** A person having origins in any of the Black racial groups of Africa
- **Asian American.** A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent

- **American Indian or Alaska Native.** A person having origins in any of the original peoples of North and South America and who maintains tribal affiliation or community attachment
- **Native Hawaiian or Other Pacific Islander.** A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands

The U.S. Census Bureau definition of “minority” also includes the following ethnic category:

- **Hispanic or Latino.** A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race

Since FTA and WSDOT began the NEPA environmental review process for the Mukilteo Multimodal Project in October 2004, they have provided frequent opportunities for the public, including minority and low-income populations, to share concerns and discuss specific project details with project staff. Public involvement activities to date have included public meetings, agency and tribal meetings, online meetings, and stakeholder briefings. For more details on this outreach, see *Chapter 7 Agency, Tribal, and Public Involvement*. WSDOT continued discussions with the public, agencies, and tribes while preparing technical reports.

### ***Determining Disproportionately High and Adverse Impacts***

To identify the potential for disproportionately high and adverse impacts on minority or low-income populations, this analysis considers five primary questions:

**Question 1:** Does the project affect a resource that is especially important to a minority or low-income population? For instance, does the project affect a resource that serves an especially important social, religious, or cultural function for a minority or low-income population?

**Question 2:** Would the project result in high and adverse impacts to a minority or low-income population?

**Question 3:** Would the project result in disproportionately high and adverse impacts that would be suffered by a minority or low-income population compared to the impacts that would be suffered by the general population?

**Question 4:** Does the project propose mitigation and/or enhancement measures?

**Question 5:** Are there project benefits that would accrue to minority or low-income populations at similar or different levels than the general population?

The answers to these five questions help show whether the project alternatives would be likely to result in disproportionately high and adverse impacts on minority or low-income populations.

## **4.5.2 Affected Environment**

This section describes the key characteristics of the social environment, including community resources, housing demographics, parks, low-income and minority populations, and other factors that contribute to community cohesion and quality of life. The study area is the same as the one used for the environmental justice analysis.

## Community Resources

Except for parks and community centers (discussed separately below), the only municipal facility located in the study area is a fire station. Several small offices in the downtown area provide a variety of limited health care services.

The Mukilteo School District serves about 14,000 students living in Mukilteo and south Everett. The study area falls entirely within the attendance boundaries of Mukilteo Elementary School, Olympic View Middle School, and Kamiak High School, although the schools are outside of the study area. Two churches are located on Third Street, near the existing ferry terminal. Two community centers, the Boys and Girls Club and the Rosehill Community Center, are in the study area, as are several parks and recreational facilities. These resources are shown on Figure 4.5-1.

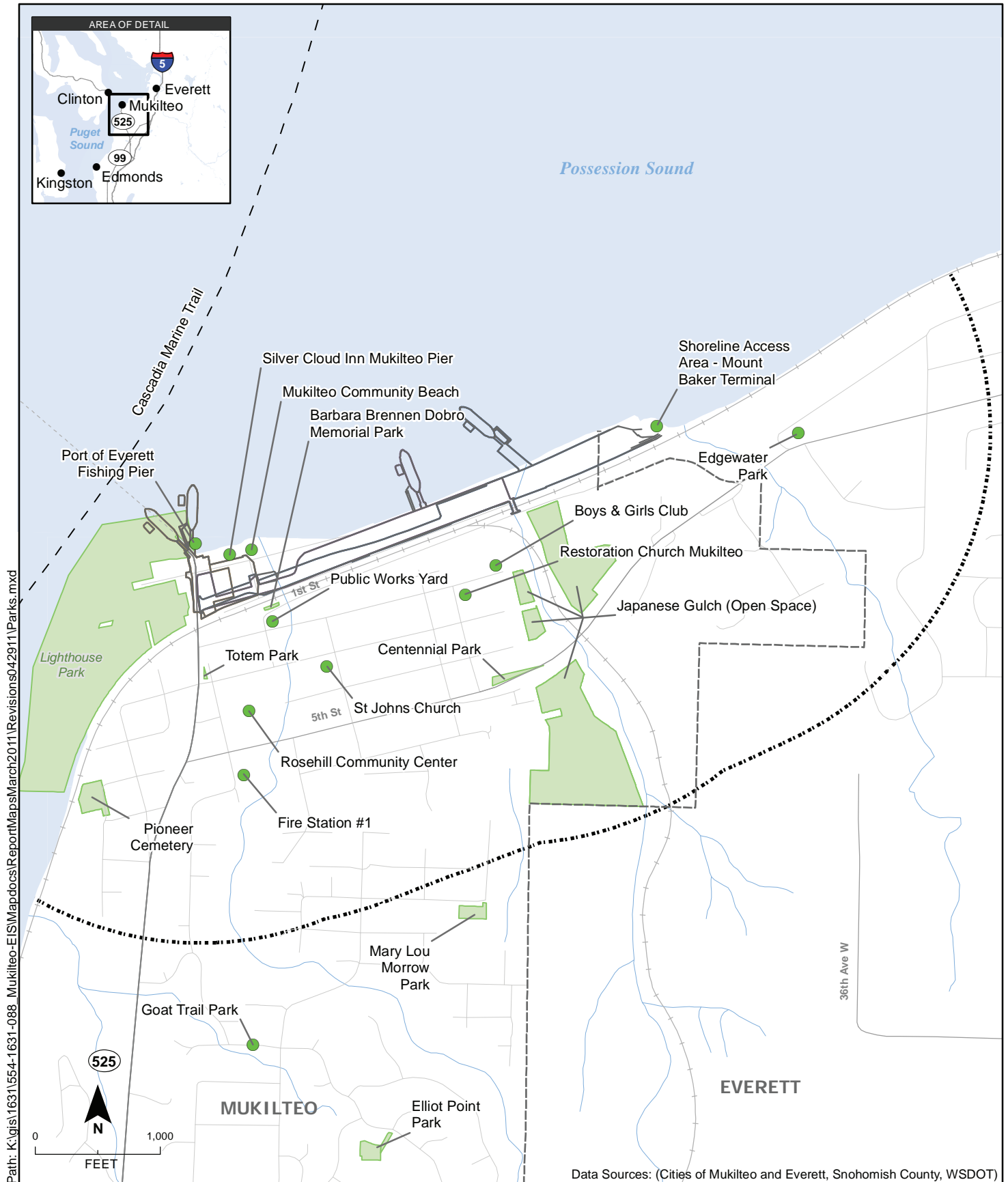
Housing exists on both sides of SR 525 from Second Street to Ninth Street, but south of Ninth Street a steep bluff limits development west of SR 525. Two other neighborhoods are located west of SR 525 in the study area: one at Horizon Heights Drive (approximately 19th Street), and the other between 80th Street SW and 84th Street SW.

Commercial development in the study area is concentrated in the old downtown area and along SR 525. The old downtown area is located east of SR 525, approximately from Sixth Street to the waterfront. As with residential development, nearly all of the commercial development has occurred east of SR 525 (see Figure 4.2-2 in *Section 4.2 Land Use and Economics*). Exceptions are the waterfront sub-area and the intersection of SR 525 and 84th Street SW, each of which has a small number of businesses west of SR 525. The waterfront sub-area currently has only one hotel, three restaurants, a small store, a building with a number of office and art-related uses, the NOAA facility, and several commercial parking lots. Most housing within the 0.5-mile study area consists of owner-occupied single-family homes. There are few homes owned by HUD or using rental assistance programs, such as those offered by the Housing Authority of Snohomish County (HASCO).

## Parks and Recreational Resources

The study area contains a number of parks and recreational facilities that provide a variety of outdoor and indoor activities (Figure 4.5-1). Some of these resources also qualify for protection under a USDOT regulation known as Section 4(f), as discussed in *Chapter 5 Section 4(f)* and *Appendix I*:

- Pioneer Cemetery is a 0.5-acre historic town cemetery, located approximately five blocks southwest of the ferry terminal, with expansive views of Puget Sound.
- The Rosehill Community Center provides a variety of indoor and outdoor athletic facilities.
- Totem Park is a 0.1-acre park adjacent to SR 525, three blocks south of the existing ferry terminal.



- Recreational Opportunities  
Parks and Recreational Facilities
- 1/2 Mile Study Area
- City Boundary

**Figure 4.5-1. Recreational and Community Resources**

- Mukilteo Lighthouse Park is on the shoreline to the west and south of the existing ferry terminal. The 14.4-acre site encompasses the former Mukilteo State Park, the former U.S. Coast Guard Light Station property, and the portion of Front Street along the park. The City's approved master plan for the park features a central lawn with open views of the lighthouse and the Sound; a pedestrian loop path system that connects with a planned pedestrian promenade along the waterfront to the east; shoreline restoration; viewpoints; a pedestrian pier; streetscape improvements; new picnic, play, and restroom facilities; and improved vehicular circulation and parking that avoids intrusions on a more pedestrian-oriented shoreline. A boat launch is currently located at the park.
- The Port of Everett fishing pier and seasonal day moorage is located just east of the Mukilteo ferry terminal.
- The Mukilteo Community Beach is a 0.3-acre parcel along the shoreline at the end of Park Street, adjacent to the west entrance of the Mukilteo Tank Farm. It offers shoreline access, community programs, and a limited amount of parking. It is also a popular site for SCUBA divers to access the offshore area.
- The Barbara Brennen Dobro Memorial Park is a 0.1-acre site in old downtown Mukilteo. The Fowler Pear Tree was planted here during the U.S. Civil War, and is a registered state historic landmark.
- Japanese Gulch is a 20-acre public open space in a ravine that carries Japanese Creek and runs from approximately the north end of Paine Field to the shoreline at the east end of the Mukilteo Tank Farm. It features hiking trails and views of Possession Sound.
- Centennial Park is a 0.25-acre park located in the northeastern part of the city. This small park includes space for picnics and features the Japanese Gulch Memorial.
- A public shoreline access area for Edgewater Beach is to the east of the Mukilteo Tank Farm in the city of Everett. Associated with the Port of Everett's Mount Baker Terminal, the access area is a City of Everett permitting condition for the terminal, with enhancements including parking, benches, and a shoreline walkway. The area is not yet officially open.
- Edgewater Park is located in the city of Everett, slightly east and upland of the project area. The 1.5-acre site includes picnic tables, tennis and basketball courts, and a playground.
- The Cascadia Marine Trail is one of 16 non-motorized water trails designated as National Millennium Trails by the White House Millennium Council. The trail crosses to the west of Point Elliot and extends through Puget Sound from Olympia to Point Roberts on the U.S.-Canada border.

## Recreational Fishing

The Port of Everett fishing pier and seasonal day moorage, as well as the public pier near the Silver Cloud Inn, provide access for recreational fishing, which is popular in and near the study area. Salmon, crab, and shrimp are typically harvested by boat, while shellfish are harvested from shore. The Washington Department of Fish and Wildlife (WDFW) divides Washington State waters into Fishing Management Areas. One of the most popular fishing areas is the bar at the south end of Whidbey Island, just offshore from Scatchet Head and Possession Point. The easiest and quickest way to reach this bar from the mainland is to launch at the Mukilteo Lighthouse Park; however, this ramp can be difficult to use in high winds. The Port of Everett boat launch in Everett is farther from the south end of Whidbey Island but is larger and more protected from wave action.

## Demographics

Racial characteristics for the study area population as of the 2010 Census are shown in Table 4.5-1. The percentage of non-white population for each census block group in and near the study area is shown in Figure 4.5-2. In the census tracts that intersect the study area, approximately 14.7 percent of the population was non-white, less than the rates found within Snohomish County (21.6 percent) and the city of Mukilteo (25.1 percent). The analysis also assesses ethnicity in terms of the non-white and white Hispanic and Latino populations that may be present. In the census tracts that intersect with the study area, approximately 4.1 percent of the population was Hispanic and/or Latino in 2010, which is less than half the rate of Snohomish County (9.0 percent) and similar to the rate within the city of Mukilteo (4.4 percent). Although the Everett city limits fall within the study area, its population is concentrated east of the study area; therefore, this population segment was not included as a comparison factor in Table 4.5-1.

**Table 4.5-1. Racial and Ethnic Composition of Residents in Snohomish County, City of Mukilteo, and Census Tracts within the Study Area**

	<b>Snohomish County</b>	<b>City of Mukilteo</b>	<b>Census Tract 413.01</b>	<b>Census Tract 413.04</b>
Total	713,335	20,254	5,117	2,870
White alone	559,011	15,172	4,456	2,359
Black or African American alone	18,168	346	53	46
American Indian and Alaska Native alone	9,793	115	34	20
Asian alone	63,385	3,457	342	265
Native Hawaiian and Other Pacific Islander alone	3,135	34	9	7
Some other race alone	27,121	227	50	47
Two or more races	32,722	903	173	126
Percent non-white	21.6	25.1	12.9	17.8
Hispanic or Latino	64,249	882	198	133

Source: U.S. Census 2010, QT-P4

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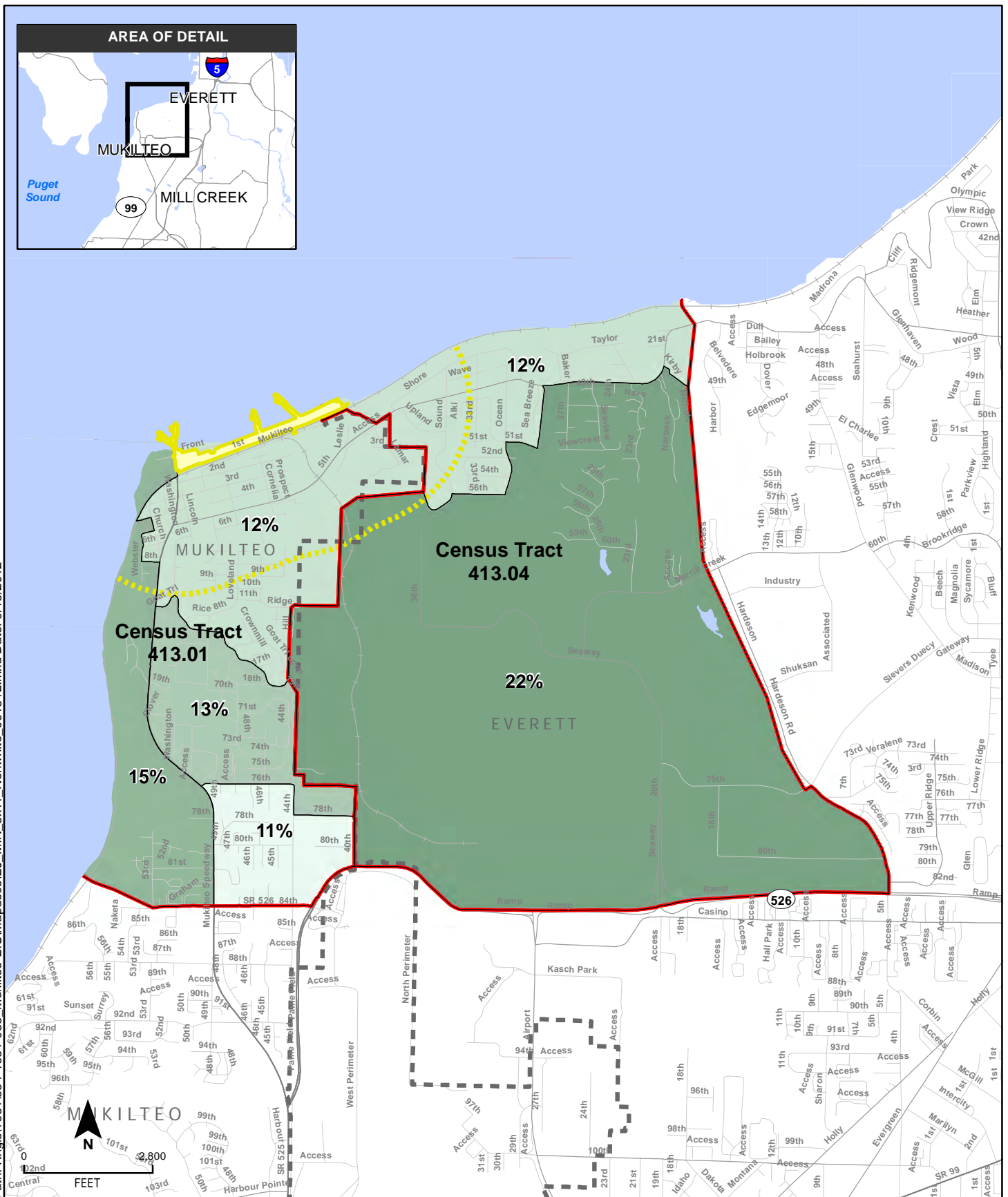


Figure 4.5-2. Percent Nonwhite

The Draft EIS reported income characteristics from the 2000 U.S. Census because that was the most current demographic data available at that time at the level of geography necessary for detailed analysis. As of 2010, the U.S. Census no longer includes income questions; therefore, the Final EIS reports income characteristics based on the 2006-2010 American Community Survey estimate. The 2006-2010 estimate is the most recent American Community Survey data release available, and reports income characteristics based on data collected from January 1, 2006, to December 31, 2010. Income characteristics for the study area census tracts are shown in Table 4.5-2. The combined poverty rate for the study area census tracts was 6.0 percent, which is lower than that found in Snohomish County (8.4 percent) and similar to the city of Mukilteo (5.7 percent). The percentage of households below the federal poverty threshold for block groups in and near the study area is shown in Figure 4.5-3.

**Table 4.5-2. Income Level of Residents in Snohomish County, City of Mukilteo, and Census Tracts within the Study Area**

Housing Type	Snohomish County	City of Mukilteo	Census Tract 413.01	Census Tract 413.04
Median household income	\$66,300	\$91,683	\$90,060	\$100,829
Share of population below poverty level (%)	8.4	5.7	7.0	4.4

Source: American Community Survey 2006-2010, B19013 and S1701/B17021

## Tribal Communities

There are no tribal reservations in the project area. Several tribes trace their ancestry to the native inhabitants of the Puget Sound region, and their members continue to live, work, fish, hunt, and participate in traditional cultural activities in locations throughout the region. These tribes include the federally recognized Lummi Nation, Muckleshoot Indian Tribe, Samish Indian Nation, Sauk-Suiattle Indian Tribe, Snoqualmie Tribe, Stillaguamish Tribe of Indians, Suquamish Tribe, Swinomish Indian Tribal Community, Tulalip Tribes, and Upper Skagit Tribe, as well as the non-federally recognized Duwamish Tribe and Snohomish Tribe.

As described in *Section 4.12 Ecosystems*, the project area supports several species of salmon, crab, shellfish, and other marine species that have always been central to tribal cultures of Western Washington. Tribal harvests focus on salmon, Dungeness crab, and shellfish. Fishing opportunities for salmon, Dungeness crab, and other shellfish are shared among federally recognized tribes of Western Washington and they have access to seasons and areas not open to the general public. The tribes also have resource management roles that they conduct in coordination with WDFW.

The primary mode of harvesting salmon is with anchored or drifting gill nets. Typically, Chinook salmon are fished from July to September, pink salmon in July, coho from early September to October, and chum salmon from mid-October through November. Tribal harvesting of Dungeness crab is accomplished mostly with pot gear, during summer low tides. Tribal clam harvesting occurs most of the year. Ghost shrimp for use as bait are harvested year-round from the sandy areas near the Port of Everett's Mount Baker Terminal.



Tribal fishers have used the Tank Farm Pier as shelter during periods of strong south winds. The Tank Farm Pier also provides habitat and refuge for crabs. The area off the upland portion of the Mukilteo Tank Farm is not typically fished with drift gear because of the proximity to the Tank Farm Pier. Fishing is precluded in the immediate area around the existing ferry terminal due to ferry traffic.

### **4.5.3 Long-Term Environmental Impacts**

Long-term social impacts from transportation projects may result from the acquisition of properties, removal of buildings and other physical features, displacement of businesses or residents, separation of neighborhoods from their community resources, impacts on traffic circulation patterns, impacts on parks, or impacts on neighborhood cohesion. Separation of a neighborhood from its community resources may be caused by operational changes such as rerouting traffic, pedestrian or transit service, as well as by introducing new physical barriers such as roadways or other transportation facilities.

#### **No-Build Alternative**

##### ***Social Impacts***

The No-Build Alternative would not alter the overall ferry terminal layout.

The surrounding community is routinely affected by the deficiencies of the current facilities. Long queues block driveways and side streets, and waterfront access is both limited and impeded by conflicts between vehicles and pedestrians.

The No-Build Alternative conditions hinder access to the waterfront, the small businesses, and the Mukilteo Lighthouse Park. In the future, increasing ferry traffic volumes would make vehicular access to the waterfront businesses more difficult.

Currently, only a small portion of ferry traffic uses residential streets to avoid traffic signals on SR 525 and SR 526, although this could worsen as ferry traffic increases in the future. An increase could undermine neighborhood cohesion.

##### ***Impacts on Parks and Recreational Resources***

Because of congestion and overall increase in traffic, ferry queues, parking constraints, and ferry loading and unloading, the No-Build Alternative would continue to hinder access to Mukilteo Lighthouse Park and Community Beach Park.

##### ***Environmental Justice Considerations***

No resources or services specific to low-income and minority populations exist in the area. There would be no impacts on low-income housing sites, social service providers, or other environmental justice resources. The Port of Everett existing fishing pier would remain, although it might be modified if it is used temporarily to provide passenger-only ferry service during replacement of the existing ferry docking facilities.

The maintenance and structure replacements associated with this alternative would not adversely affect the occurrence or abundance of aquatic species, including species harvested by tribal fishers.

## **Preferred Alternative**

### ***Social Impacts***

The Preferred Alternative would convert a portion of the Mukilteo Tank Farm to a multimodal transportation use with a public waterfront promenade, and it would remove the existing ferry terminal facilities. This alternative would improve access and safety for the central waterfront, and it would move ferry traffic and operations out of the central waterfront. An improved network of pedestrian facilities extending east would also help unify the waterfront area.

As described in *Chapter 3 Transportation*, this alternative would provide the shortest walk between the multimodal connections.

The Preferred Alternative also would extend First Street and provide a new signalized intersection at SR 525 and First Street. The First Street extension would displace the Mongrain Building, which houses a glass blowing art studio and other businesses. Compensation and relocation assistance would be provided in compliance with applicable regulations. First Street would feature sidewalks and bicycle lanes. By improving bus circulation, this alternative would improve bus service between the waterfront and nearby social resources. By improving bus and rail connections, this alternative would benefit rail users in the community.

The Preferred Alternative would increase areas available to queue vehicles waiting to reach the terminal and would provide adjacent bus facilities. As discussed in *Chapter 3 Transportation*, the queue length for the Preferred Alternative would still extend to SR 525, but the additional capacity would reduce traffic congestion, cut-through traffic, blocked driveways, and other impacts in the adjacent neighborhoods compared to the No-Build or Existing Site Improvements alternatives.

### ***Impacts on Parks and Recreational Resources***

The Preferred Alternative would include a pedestrian walkway from First Street to a waterfront promenade. The passenger building would provide part of the continuous pedestrian walkway. The Port of Everett fishing pier and day moorage would be relocated to the Mukilteo Tank Farm site.

The demolition of the Tank Farm Pier would remove a known dive site, and the operation of the ferry in the area would restrict other fishing or diving activities in the immediate vicinity. However, the removal of the existing ferry terminal would allow for more opportunities for public shoreline access in the central waterfront area.

The transit center would include layover facilities for transit, which would reduce the need for buses to use Mukilteo Lighthouse Park for layover parking. Similarly, the removal of the existing ferry terminal and its related traffic on Front Street would improve access, safety, and parking availability for the park.

## Environmental Justice Considerations

Minority or low-income populations would not bear disproportionately high and adverse impacts from the Preferred Alternative. No services specific to low-income or minority populations exist in this area. There would be no impacts on low-income housing sites, social service providers, or other environmental justice resources.

Treaty rights preserve the right for certain Native American tribes to harvest fish in their usual and accustomed areas. The project is located within areas designated as usual and accustomed by the Treaty of Point Elliott.

The Port of Everett fishing pier and day moorage provides a location for public fishing and is available to people with low incomes, including people who may rely upon fishing as a primary source for food. The Preferred Alternative would reconstruct the existing fishing pier. To avoid longer term disruption to fishing as well as to provide a more open waterfront near the existing terminal, the Preferred Alternative would relocate the fishing pier and day moorage to the east of the new terminal. With the new fishing pier in place before the existing fishing pier is demolished, there would be no impacts on public fishing activities relying on the pier.

While the Preferred Alternative would not adversely affect any specific facility serving low-income or minority populations, the EIS analysis considered other impacts to fishing as a potential environmental justice issue. As discussed in *Section 4.12 Ecosystems*, the Preferred Alternative would not adversely affect the occurrence or abundance of aquatic species, including species that are harvested by tribal fishers, or other recreational or commercial fishermen.

The crab populations that live under or just west of the Tank Farm Pier may relocate when the pier is removed, but this is not expected to alter the abundance of crabs that are available to fishers in the area.

Removal of the existing ferry terminal and the Tank Farm Pier would open up additional waters for tribal, public, and commercial fishing. Fishing activities, including fishing by tribal members, would be affected by the physical presence of the proposed new ferry terminal as well as by the removal of the Tank Farm Pier, which currently can provide shelter during storms and high winds.

Current clamming areas and ghost shrimp harvest areas would remain accessible to tribal fishers. Upon completion of the new ferry terminal, portions of the Mukilteo Tank Farm shoreline, waters around the Tank Farm Pier, and some currently fenced or restricted areas would become more publicly accessible, although ferry navigation and terminal security would still restrict certain areas. FTA, in coordination with WSDOT, is conducting government-to-government consultations with affected tribes to resolve potential issues associated with treaty rights.

Potentially beneficial permanent impacts on area fish and shellfish include improvements to water quality and sediment over the long term resulting from the

### Usual and Accustomed Fishing Areas

The Treaty of Point Elliott reserved to signatory tribes their right to hunt, fish, and gather at their usual and accustomed places.

In the project area, four tribes have usual and accustomed fishing rights: Lummi Nation, Suquamish Tribe, Swinomish Indian Tribal Community, and Tulalip Tribes.

removal of creosote-treated timber at the existing ferry terminal and the Tank Farm Pier (see *Section 4.11 Water Resources*).

Considering all of the above, and assuming agreements addressing treaty rights are executed, there would not be high or adverse impacts to public and tribal fishing activities, and consequently no associated environmental justice impacts.

The construction of this alternative has the potential to encounter archaeological resources, including a site of significance to Native Americans. The alternative is designed to avoid encountering this resource, as described in *Section 4.6 Cultural Resources*. The project's Section 106 Memorandum of Agreement includes measures developed with tribal representatives and others to resolve adverse effects to the resources.

## **Existing Site Improvements Alternative**

### ***Social Impacts***

The Existing Site Improvements Alternative would make limited improvements at the existing site, replacing and realigning existing ferry facilities such as the ferry slip and trestle. Congestion and vehicle/pedestrian conflicts at the Front Street-SR 525 intersection would continue to impair the integration of the Mukilteo waterfront with the surrounding community.

This alternative would remove the existing Port of Everett fishing pier and seasonal day moorage and displace Ivar's restaurant and art-related businesses at Park Avenue and First Street, but compensation and relocation assistance would be provided. However, the displacement of these resources would further reduce the limited commercial activities that help draw people to the waterfront area for reasons other than the ferry. The fishing pier is used extensively by the local community and is one of a limited number of shoreline recreational fishing opportunities open to the public in the area. A potential replacement location has been identified; see Figure 2-3 in *Chapter 2 Alternatives*.

This alternative would slightly increase the walk from the ferry to buses relative to the No-Build Alternative, but the improved bus transit center would offer more amenities (shelter, route information, benches) for passengers, and it is closer to the commuter rail Mukilteo Station. Because of the extension of First Street and the new intersection at First Street and SR 525, bus service would improve between the Mukilteo waterfront and nearby social resources. The proximity of the new transit center and the commuter rail station would improve bus-rail connections for rail users in the community.

This alternative, with overhead loading included, would also help reduce delays in the ferry system operations, benefiting all populations, but queue lengths would still extend back onto SR 525. The Draft EIS public comments have shown queues are a concern to surrounding neighborhoods.

## **Impacts on Parks and Recreational Resources**

The Existing Site Improvements Alternative would remove the Port of Everett public fishing pier and seasonal day moorage, which is a recreational resource used by the community and the public. If not replaced prior to its removal, the loss of the pier would be an impact on a recreational resource for the community because it is one of a limited set of shoreline recreational fishing opportunities available to the public in the area.

As discussed for the No-Build Alternative, congestion on the waterfront would continue to impair access to Mukilteo Lighthouse Park and Mukilteo Community Beach.

## **Environmental Justice Considerations**

There are few impacts that would potentially affect minority or low-income populations disproportionately. Some displaced employees from Ivar's restaurant may be from low-income or minority groups. These employees could be retained if Ivar's were relocated to an area suitable for its business and if the restaurant's operations can transition without a long period of disruption. Otherwise, these individuals could lose their jobs permanently.

The existing fishing pier and day moorage would be removed. Low-income or minority people who rely on fishing as a food source would be affected if no replacement facility is provided before removal. A user survey conducted by WSDOT in October 2011 found that minority and low-income people use the pier, although the number of users fluctuates throughout the year. To avoid affecting people who might rely on fishing from the pier for subsistence, the project would need to provide a temporary or replacement site for public fishing access. Additional outreach to pier users prior to construction would also help avoid impacts.

As discussed in *Section 4.12 Ecosystems*, the Existing Site Improvements Alternative would not adversely affect the occurrence or abundance of aquatic species, including species that are harvested by tribal fishers.

As discussed in *Section 4.6 Cultural Resources*, the project's construction could affect archaeological resources, many of which are important to Native Americans.

To implement this alternative, FTA and WSDOT would need to continue coordination and government-to-government consultations with affected tribes to resolve any issues associated with treaty rights. FTA would also continue Section 106 consultations to address adverse effects on cultural resources of significance to the tribes. With these issues resolved, no adverse effects on environmental justice populations are expected.

## **Elliot Point 1 Alternative**

### **Social Impacts**

This alternative would convert a portion of the Mukilteo Tank Farm to a multimodal transportation use with public shoreline access features, and it would remove the existing ferry terminal facilities. This alternative would improve access to the central

waterfront and the waterfront near the Mount Baker Terminal and would integrate the Mukilteo downtown area with the waterfront.

The distance between the ferry and local bus service at the new transit center is a short walk (about 540 feet or 0.11 mile). The distance from Mukilteo Station to the ferry terminal would be about the same as it is today (about 1,970 feet or 0.37 mile).

This alternative would extend First Street to the Mount Baker Terminal and provide a new signalized intersection at SR 525 and First Street. First Street would feature sidewalks and bicycle lanes. As with the Existing Site Improvements Alternative, by improving bus circulation, this alternative would improve bus service between the waterfront and nearby social resources. By improving bus-rail connections, this alternative would benefit rail users in the community.

This alternative would increase areas available to queue vehicles waiting to reach the terminal and would provide adjacent bus facilities. As discussed in *Chapter 3 Transportation*, the queue would not reach SR 525. The additional capacity would reduce traffic congestion, cut-through traffic, blocked driveways, and other impacts in the adjacent neighborhoods compared to the No-Build Alternative. As discussed below, the public shoreline area near the Mount Baker Terminal would be modified but maintained. Community access to Mukilteo Station would remain generally the same as it is today.

### ***Impacts on Parks and Recreational Resources***

The Elliot Point 1 Alternative would modify some of the dedicated public access area at the Mount Baker Terminal, but would still provide the access and parking required by permit for the shoreline area. The alternative would also extend the shoreline areas available to the public and open a larger section of the shoreline to public access than is currently available by providing a shoreline promenade to the west and east of the new ferry terminal.

The demolition of the Tank Farm Pier would remove a known dive site, and the operation of the ferry in the area would restrict other fishing or diving activities in the immediate vicinity. However, the removal of the existing ferry terminal would allow for more opportunities for public shoreline access in the central waterfront area.

The transit center would include layover facilities for transit, which would reduce the need for buses to use Mukilteo Lighthouse Park for layover parking. Similarly, the removal of the existing ferry terminal and its related traffic on Front Street would improve access, safety, and parking availability for the park.

### ***Environmental Justice Considerations***

No services specific to low-income or minority populations exist in this area. There would be no impacts on low-income housing sites, social service providers, or other environmental justice resources.

The existing Port of Everett fishing pier and day moorage provides a location for public fishing and is available to people with low incomes, including people who may rely upon fishing as a primary source for food. The Elliot Point 1 Alternative would relocate the fishing pier and day moorage.

As with the Preferred Alternative, removal of the Tank Farm Pier and establishment of a new ferry terminal could alter existing tribal fishing practices, but could open new areas by removing the existing ferry terminal. FTA is conducting government-to-government consultations with affected tribes and coordinating with WSDOT to resolve potential issues associated with treaty rights.

As discussed in *Section 4.6 Cultural Resources*, the project's construction could affect prehistoric archaeological resources important to Native Americans and historic archaeological resources important to Japanese-Americans. This alternative has the least overlap with the prehistoric site and has the lowest potential for impacts. FTA would continue to conduct Section 106 consultations to address adverse effects.

#### **4.5.4 Construction Impacts**

This section addresses the temporary impacts that may result from the construction of new facilities, hauling of materials, and the staging of major construction activities.

Both standard practices and context-specific measures will be incorporated into the project to reduce noise, light and glare, and air quality impacts during construction, including truck traffic impacts on the community, as discussed in more detail in *Chapter 3 Transportation* and *Sections 4.3 Noise and Vibration; 4.4 Visual Quality, Aesthetics, and Light and Glare; and 4.7 Air Quality*. Construction activities are not expected to have disproportionately high and adverse impacts on low-income and minority populations.

#### **No-Build Alternative**

Construction would take place only as facilities require replacement. Construction would have temporary impacts on adjacent uses from noise and temporary disruption of traffic circulation. As described in *Chapter 3 Transportation*, this would temporarily alter access and increase delays to businesses and other uses along the waterfront, but access is expected to be maintained.

The construction would fully close the facility for a 4- to 9-month period. Full closure would have the greatest transportation impact on ferry users primarily because the ferry route would be redirected to Edmonds. Waterfront traffic circulation would improve without ferry operation but patronage at some businesses could decline because area activity levels would decrease. Construction activities conducted while the terminal is in operation would result in some disruptions to ferry operations and traffic patterns. Nearby residents would be subject to increased dust, dirt, traffic, visual impacts, and other inconveniences during the construction period. As detailed in *Section 4.3 Noise and Vibration*, higher noise levels would occur during construction, but mitigation measures are identified to avoid adverse impacts on sensitive receptors such as the hotel and residences near the existing terminal.

The No-Build Alternative could result in a temporary closure of the Port of Everett fishing pier. A nearby public pier beside the Silver Cloud Inn could be used instead. Users of Mukilteo Lighthouse Park would also experience higher noise levels during construction.

*Section 4.12 Ecosystems* contains a more detailed discussion of potential impacts on fishing. Whenever in-water work is conducted, fish distribution or abundance may be temporarily affected, which may disrupt typical tribal and non-tribal fishing activities. Fishing may be affected by noise, vibration, construction activities, and turbidity. The presence of barges and other construction vessels and equipment could also interfere with the use of private boats in the vicinity for fishing or other activities.

### **Preferred Alternative**

Because construction of the Preferred Alternative would take place on the Mukilteo Tank Farm, operation of the existing ferry terminal would continue until construction is complete. Impacts due to the removal of the existing ferry terminal facilities, such as noise, dust, disruption from demolition, or from trucks hauling debris away from this location, would occur for 1 to 2 months after the new ferry terminal is in place and operating.

For most other construction activities, only minor noise, vibration, and visual impacts would be expected because the Mukilteo Tank Farm would not be open to the public during construction and it is not near homes or businesses.

Construction traffic would temporarily affect the downtown street system and cause delays on local streets and SR 525.

Construction impacts to recreational facilities would be largely limited to proximity impacts. The Port of Everett fishing pier and seasonal day moorage would be replaced prior to demolition, which avoids impacts to these types of recreational uses. Impacts would be limited as well at the Mukilteo Lighthouse Park, because aside from demolition of the existing terminal, most of the construction would be away from the park site. Demolition of the existing terminal could create short-term proximity impacts such as noise or visual impacts for park users, primarily in the areas of the park closest to the terminal.

Potential impacts on recreational fishing and crabbing from offshore areas may result from in-water work; the Preferred Alternative requires more in-water work than the No-Build Alternative or the Existing Site Improvements Alternative and is similar to the Elliot Point 1 Alternative. In-water work may temporarily affect fish distribution or abundance, which would in turn disrupt typical tribal and non-tribal fishing activities. A large population of crabs is present in the Tank Farm Pier area. Individual crabs could be injured or killed during pile removal or placement, but overall impacts on crab populations would not be substantial (see *Section 4.12 Ecosystems*). Impacts to recreational fishing opportunities are not expected but may occur if there is a period of time between demolition and replacement of the Port of Everett fishing pier.

### **Existing Site Improvements Alternative**

Construction and demolition activities would be staged to minimize disruptions to existing ferry operations and traffic patterns. The construction of a replacement facility on and adjacent to the existing ferry terminal site would complicate access to waterfront area properties, as well as public waterfront areas nearby. As described in *Chapter 2 Alternatives*, construction would close the terminal facility for 1 to 2 months,

which is longer than other Build alternatives but shorter than with the No-Build Alternative.

Nearby residents would be subjected to noise, dust, dirt, traffic, visual impacts, and other disruptions during the construction period at levels that are greater than those described for the No-Build Alternative. The construction period would not extend for as long a period as that of the No-Build Alternative.

The closure and demolition of the public fishing pier and seasonal day moorage during construction of the Existing Site Improvements Alternative would remove one of a limited number of shoreline recreational fishing locations open to the public in the area. If construction occurs during the offseason, day moorage would not be affected. In the Draft EIS, WSDOT identified two options for replacing the facility, but both have limitations. If a replacement can be constructed before the current facility is removed, impacts on recreational use would be reduced. This would also help avoid impacts on low-income or minority individuals who rely on fishing as a food source. Other recreational properties would remain open to the public during construction and demolition. Construction could affect access to and from Mukilteo Lighthouse Park and the public pier beside the Silver Cloud Inn. The access changes would include detours, delays, and alternative pathways for pedestrians and bicyclists.

Similar to the No-Build Alternative, potential impacts on fishing may result from in-water work.

### **Elliot Point 1 Alternative**

Construction impacts on community cohesion and social resources or interactions would be low and primarily related to construction traffic, similar to those for the Preferred Alternative. Only minor noise, vibration, and visual impacts would be expected because the Mukilteo Tank Farm would not be open to the public and it is not near homes or businesses.

Construction impacts on parks and recreation would be similar to those for the Preferred Alternative, assuming the fishing pier and seasonal day moorage would be relocated to be part of the new multimodal facility.

The public shoreline access area developed as part of the Mount Baker Terminal is not yet open to the public because its permanent access requires tank farm property that would not be available until after the transfer of the property from the U.S. Air Force. The opening of the shoreline access area would be coordinated with the construction of the Mukilteo Multimodal Project because the extension of First Street would be needed as part of the access route; therefore, construction impacts are not anticipated.

### **4.5.5 Indirect and Secondary Impacts**

Major transportation projects can have community impacts that are removed in time or space from the project area, such as job creation, gentrification, and redevelopment.

## **No-Build Alternative**

No indirect impacts are anticipated.

## **Preferred Alternative**

This alternative would indirectly benefit community cohesion by providing the opportunity for redeveloping the waterfront area, and helping the City of Mukilteo achieve its planned vision for the downtown area and Mukilteo Lighthouse Park. This alternative would remove the existing ferry terminal features and operations that are in the center of the downtown waterfront area and adjacent to the Mukilteo Lighthouse Park. A portion of the current holding lanes that are on property leased by WSDOT would be available for other development.

## **Existing Site Improvements Alternative**

No indirect impacts are anticipated.

## **Elliot Point 1 Alternative**

The indirect impacts of the Elliot Point 1 Alternative would be similar to those for the Preferred Alternative.

## **4.5.6 Cumulative Impacts**

### **No-Build Alternative**

This alternative would not affect the Mukilteo Tank Farm. The entire 18.85-acre parcel proposed for transfer to the Port of Everett would be available for development. The City of Mukilteo anticipates the land would be redeveloped as a recreational resource. The redevelopment of the Mukilteo Tank Farm would likely have some positive impacts on the city of Mukilteo and the immediate surrounding neighborhood. This redevelopment would improve local recreation options such as more opportunities for shoreline access, as well as a potential City proposal to relocate a boat launch currently at Mukilteo Lighthouse Park. However, because the No-Build Alternative would not improve the transportation infrastructure in the vicinity of the ferry terminal, lack of access and continued traffic congestion would hinder or limit redevelopment of the Mukilteo Tank Farm.

Pending a land transfer from the U.S. Air Force, the NOAA Mukilteo Research Station is expected to be redeveloped and expanded to include additional public education and research facilities. Plans are still in early stages, but these activities could help enhance the vitality of the waterfront area.

WSDOT has indicated that it does not have plans to fund or build any improvements to SR 525 that would increase its capacity before 2030. However, due to the forecasted increase in traffic volumes on SR 525 from ferry service demand, increased ridership at the Mukilteo Station, development of the remaining Mukilteo Tank Farm, and increases in general traffic, the combined contributions from these traffic generators may accelerate the need for several road improvements that could ease congestion and improve safety. If they occur, these improvements would

enhance the public's ability to access the area's parks and recreational resources, as well as social resources, businesses, and residences.

### **Preferred Alternative**

Relocation of the ferry terminal would result in WSDOT vacating the existing ferry terminal site, potentially allowing a consolidated area of about 1 acre for redevelopment. On the Mukilteo Tank Farm, approximately 5 acres would remain available for development, and could include community facilities, depending on proposals to be developed by the Port of Everett or others. This potential development would be subject to a separate permitting and environmental approval process. The City of Mukilteo has expressed an interest in relocating the boat launch ramp currently at Mukilteo Lighthouse Park to the Mukilteo Tank Farm. Removing the boat launch from Mukilteo Lighthouse Park would help improve the pedestrian and shoreline access functions called for in the park's master plan, and reduce areas needed for parking and boat loading and unloading. This alternative would construct roadways that would improve local circulation. The roadway improvements also extend towards, but not to, the public shoreline area near the Mount Baker Terminal, which would support the proposed boat launch relocation.

The alternative's roadway improvements could support plans for the NOAA Mukilteo Research Station redevelopment, which may be expanded to include additional public education and research facilities that would be open to the community and could help support revitalization of the central waterfront.

### **Existing Site Improvements Alternative**

The cumulative impacts of the Existing Site Improvements Alternative and the related redevelopment of the Mukilteo Tank Farm would be similar to those reported for the No-Build Alternative above.

### **Elliot Point 1 Alternative**

Similar to the Preferred Alternative, the Elliot Point 1 Alternative would provide opportunities for redevelopment to occur at the site of the existing ferry terminal (about 1 acre) and on portions of the Mukilteo Tank Farm not needed for transportation purposes (about 6 acres). Elliot Point 1 would provide additional support for relocating the existing boat launch ramp currently at Mukilteo Lighthouse Park because this alternative would extend First Avenue to the Mount Baker Terminal and shoreline access area. Similar to the Preferred Alternative, this alternative's improvements to local circulation and access could also support plans for the NOAA Mukilteo Research Station to be expanded to include additional public education and research facilities.

## **4.5.7 Mitigation Measures**

The Mukilteo Multimodal Project is expected to have relatively minor long-term social impacts. Consequently, little mitigation would be required for impacts on social resources, nearby residents, or environmental justice populations.

## **Mitigation for Long-Term Impacts**

As described in *Section 4.2 Land Use and Economics*, property owners of parcels to be acquired would be compensated, and residents and business owners who would be displaced as a result of the proposed property acquisitions would receive relocation assistance in accordance with state and federal law.

## **Mitigation for Impacts on Parks and Recreational Resources**

For the Preferred Alternative and Elliot Point 1, WSDOT would replace the Port of Everett fishing pier and seasonal day moorage at the new multimodal center prior to the removal of the existing fishing pier and moorage. The Existing Site Improvements Alternative would need to identify a relocation site within the existing waterfront area of the city of Mukilteo, but these options are limited. Additional coordination with the City and Port, as well as pier users, would be needed to mitigate the pier removal and avoid an impact.

Although the public shoreline access area at the Mount Baker Terminal would be modified as part of the Elliot Point 1 Alternative, the alternative would maintain parking and access and provide a promenade that would connect to the site.

## **Environmental Justice Considerations**

Interference with access to tribal fisheries, if not mitigated, would be the only foreseeable environmental justice impact. FTA is pursuing government-to-government consultations with affected tribes and coordinating with WSDOT to resolve potential issues associated with treaty rights. As with other legal requirements that must be satisfied as a condition of federal funding, the potential treaty issues must be resolved for the project to advance.

As described in *Section 4.6 Cultural Resources* and in the *Cultural Resources Discipline Report*, mitigation measures for potential adverse impacts to archaeological resources were developed in consultation with interested tribes and parties, and the State Historic Preservation Officer.

## **Mitigation for Construction Impacts**

For the Preferred Alternative and all other alternatives, a project communication and public awareness program would describe the changes occurring on the Mukilteo waterfront and inform the public that businesses there are open and accessible during construction. WSDOT, the Port of Everett, Sound Transit, and the City of Mukilteo would coordinate construction activities if multiple projects in the waterfront area are implemented concurrently.

During construction, reduced parking along Front Street would negatively affect businesses on the waterfront by impeding customer and employee access. Potential mitigation measures to address construction impacts on businesses, and closure of the terminal, are identified in *Section 4.2 Land Use and Economics*.

Public notification of proposed construction activities, including timing of construction, would be provided to all local service providers and schools within the immediate vicinity of the project site.

Recycling of demolition debris on site has been incorporated into construction practices to reduce the amount of material hauled off site to regional facilities and decrease truck traffic on roadways. A construction traffic control plan would be developed prior to construction to minimize disruptions to traffic patterns during construction, as described in *Chapter 3 Transportation*.

Mitigation measures for traffic, noise, and visual impacts are discussed in *Chapter 3 Transportation*, *Section 4.3 Noise and Vibration*, and *Section 4.4 Visual Quality, Aesthetics, and Light and Glare*, respectively.

For the No-Build Alternative and the Existing Site Improvements Alternative, the Port of Everett fishing pier would be closed during construction. The closure of the pier could be partially mitigated by encouraging the use of the nearby public pier adjacent to the Silver Cloud Inn and by public information and signage identifying other available locations for fishing.

#### **4.5.8 Environmental Justice Final Determination**

The preceding sections evaluated the potential for direct or indirect social impacts in general. As described in these sections, and summarized below, the Preferred Alternative would not result in disproportionately high and adverse impacts on minority or low-income populations.

**Question 1:** Does the Preferred Alternative affect a resource that is especially important to a minority or low-income population?

The Preferred Alternative will not displace housing, social service providers, unique ethnic establishments, or other resources that are particularly important to low-income and minority populations. The Preferred Alternative will displace and relocate a fishing pier and day moorage. It will also remove the Tank Farm Pier. Adverse effects on natural resources are not anticipated and the Preferred Alternative is not likely to change the availability or abundance of marine species. Several key elements, such as the removal of the Tank Farm Pier, are expected to provide environmental benefits due to the removal of over-water structures and potential sources of contamination. While tribal members will continue to use the Mukilteo shoreline to harvest salmon, shrimp and crabs, the Preferred Alternative will interfere with or prohibit fishing access at certain places. The tribal fishing rights issue is being addressed through government-to-government consultations with tribes. Impacts to archaeological resources, including a midden, are addressed through the project's Section 106 Memorandum of Agreement, as discussed below for Question 4.

**Question 2:** Will the Preferred Alternative result in high and adverse impacts to a minority or low-income population?

No high and adverse impacts to minority or low-income populations are anticipated.

**Question 3:** Will the Preferred Alternative result in disproportionately high and adverse impacts that will be suffered by a minority or low-income population compared to the impacts to the non-minority and/or non-low-income population?

No disproportionately high and adverse impacts to minority or low-income populations have been identified.

**Question 4:** Does the Preferred Alternative propose mitigation and/or enhancement measures?

Yes. Through the Section 106 process and EIS development, WSDOT, FTA, cooperating and participating agencies, and tribal governments worked closely to develop mitigation measures and agreements with consulting tribes on ecosystems and natural resources, archaeological resources, and other issues of interest to Native Americans. Design refinements and mitigation measures were developed through consultations with the consulting tribes and others to address impacts on resources important to Native Americans. Impacts on tribal treaty rights are being addressed through government-to-government agreements. With mitigation and other anticipated agreements, there would not be high or adverse impacts remaining in any area of the environment.

The project's improvements and its mitigation measures will benefit minority and low-income populations as well as the general population. The benefits include: environmental cleanup, improved public transportation, improved access to the shoreline, improved economic development conditions, and improved safety and security.

**Question 5:** Are there Preferred Alternative benefits that will accrue to minority or low-income populations at similar or greater levels than the general population?

As described above, the Preferred Alternative will benefit enhanced public shoreline access and the aquatic environment through the removal of the Tank Farm Pier over-water structures and piles that are potential sources of contamination. These benefits will occur for environmental justice populations at similar or higher levels than the general population.

Also, the jobs created to construct the new terminal facilities will be available for low-income and minority populations; moreover, targeted outreach can increase the potential for low-income or minority individuals to obtain these jobs. The Preferred Alternative provides increased transit capacity and reliability, as well as improved safety conditions for motorists, bicyclists, and pedestrians accessing the ferry and the waterfront. The improvements in transit and non-motorized access will benefit low-income individuals at the same or higher levels as the general population because these modes are lower in cost than vehicular use.

## 4.6 Cultural Resources

This section discusses the project's effects on cultural resources. This analysis was conducted in compliance with the National Historic Preservation Act (NHPA) and its implementing regulations with FTA as the lead federal agency.

#### 4.6.1 Overview of Analysis and Regulatory Context

The NHPA requires federal agencies, in this case FTA, to identify and assess the effects of federally assisted undertakings on historic properties and to consult with others to find acceptable ways to avoid or mitigate adverse effects. Properties protected under Section 106 of the NHPA are those that are listed in or are eligible for listing in the National Register of Historic Places (NRHP). Eligible properties generally must be at least 50 years old, possess integrity, and meet at least one of four criteria of significance. Historic properties may include archaeological sites, buildings, structures, districts, or objects.

In consultation with the State Historic Preservation Officer (SHPO), at the Washington State Department of Archaeology and Historic Preservation (DAHP), FTA determined the project Area of Potential Effects (APE) for archaeological resources and historic buildings and structures. The APE encompasses an area beginning west of SR 525 at Elliot Point (current name for the geographic area where the Point Elliott Treaty was signed) and extending 0.75 mile east along the shoreline, well beyond the end of the Mukilteo Tank Farm (Figure 4.6-1). The BNSF railroad tracks generally mark the southern boundary of the APE. Although the project's direct, physical impacts would be limited to a smaller area, the APE was drawn large enough to accommodate potential indirect impacts, such as visual and auditory changes, and vibration on cultural resources.

According to the NHPA implementing regulations, certain people or groups are automatically entitled to *consulting party* status, including federally recognized and potentially affected Native American tribes (36 CFR 800.2). WSDOT and FTA are consulting with the federally recognized Tulalip Tribes, Suquamish Tribe, Swinomish Indian Tribal Community, Muckleshoot Indian Tribe, Samish Indian Nation, Sauk-Suiattle Indian Tribe, Snoqualmie Tribe, Stillaguamish Tribe of Indians, Upper Skagit Tribe, and the Lummi Nation. FTA and WSDOT have also consulted with the non-federally recognized Duwamish Tribe and Snohomish Tribe. In addition to DAHP and the tribes, consulting parties on this project include the U.S. Army Corps of Engineers, U.S. Air Force, Advisory Council on Historic Preservation (ACHP), Mukilteo Historical Society, Historic Everett, City of Mukilteo, Snohomish County Historic Preservation Commission, and the Japanese Cultural and Community Center.

#### 4.6.2 Affected Environment

The project has identified five resources in the APE that are listed in or eligible for listing in the NRHP.

- Mukilteo Shoreline Site, a NRHP-eligible archaeological site with stratified pre-contact shell midden deposits

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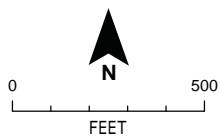
##### Key Terms

**shell midden** – A shell midden or shell mound is an archaeological feature consisting mainly of mollusk shells where aquatic resources were prepared directly after harvest and prior to use or storage. Shell middens often reveal what food was eaten or prepared and include many fragments of stone tools and household goods.

**stratification** (building of layers) – The Mukilteo Shoreline Site includes bedded layers of crushed shell, charcoal, charcoal-stained sediments, and fire-modified rock deposited on top of the clean sand and gravel of the beach berm.

**Circular definition: lifeway** – A custom, practice, or art reflecting the traditional lifeways of a tribal society.

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— Area of Potential Effects

Figure 4.6-1. Historic and Cultural Resources Area of Potential Effects

- Point Elliott Treaty Site, a NRHP-eligible site where the 1855 treaty between the U.S. government and Puget Sound Native American tribes was signed
- Old Mukilteo Townsite, a NRHP-eligible archaeological site with buried remnants of the early Mukilteo business district
- Japanese Gulch Site, a NRHP-eligible site with buried deposits associated with early 20th century Japanese mill workers
- Mukilteo Light Station, a NRHP-listed early 20th century lighthouse complex

The following pages describe these resources, which are also included in *Appendix I Section 4(f) Evaluation*, and summarized in *Chapter 5 Section 4(f)* of this Final EIS.

FTA determined, with concurrence from DAHP, that nine other properties are not eligible for NRHP listing, including the buildings and structures on the property now owned by the U.S. Air Force, as well as the Ivar's restaurant building, and the existing Mukilteo ferry terminal. Resources found not to be eligible for the NRHP are not subject to the NHPA and are not discussed in this section. The *Cultural Resources Discipline Report* includes details on those resources.

### 4.6.3 Historic Background

The Mukilteo vicinity, with a Salish name meaning “a good place to camp” or “goose neck,” was well known historically as a gathering place for local Native American people. The importance of the area to Native American groups is reflected in its selection as the site for the signing of the Point Elliott Treaty in 1855. Euroamerican settlement of the site vicinity began soon after signing of the treaty, with J.D. Fowler and Morris Frost filing the first land claims. By 1858, Fowler and Frost had established a post for trading with local Native American residents; a store, saloon, hotel, and a post office soon followed (Figure 4.6-2).

In 1903, the Mukilteo Lumber Company established a mill on the Mukilteo waterfront, which was acquired in 1909 by the Crown Lumber Company. This mill, which employed both Euroamerican and Japanese workers, operated until 1930. The last of its buildings was destroyed by fire in 1938. The mill site was subsequently acquired by the U.S. Army and an ammunition shipping facility was built in the early 1940s. Ownership of this facility was transferred to the U.S. Air Force in 1951 for construction of a fuel supply depot and tank farm.



Figure 4.6-2. **Photo Showing Indians, Canoes, Early Settlers, and J.D. Fowler with his Oxen at Mukilteo**

The five cultural resources discussed below have been determined eligible for, or are listed in, the NRHP because they meet one or more of four National Park Service criteria of significance:

- A. The property is associated with events that have made a significant contribution to the broad patterns of our history.
- B. The property is associated with the lives of persons significant in our past.
- C. The property embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D. The property has yielded, or is likely to yield, information important in prehistory or history.

## Mukilteo Shoreline Site

The Mukilteo Shoreline Site (designated 45SN393 by DAHP) was identified in 2005 during initial cultural resource studies for the Mukilteo Ferry Terminal Project. The site's original landforms have been obscured by pavement and buildings or buried beneath fill. The north-facing shoreline of Elliot Point has been at least occasionally occupied by Native Americans for approximately 1,000 years. The Mukilteo Shoreline Site contains the remnants of this occupation, including a thick, horizontally extensive shell midden over 1,500 feet (0.3 mile) in length. The midden is characterized by intact, bedded layers of crushed shell, charcoal, charcoal-stained sediments, and fire-modified rock. The alkaline depositional environment of the shell midden has created ideal preservation conditions for bone, in the form of both unmodified animal

remains and fragments of mammal bone and beaver teeth modified into tools. Within the shell midden layers are the remains of animals that were hunted, fished, and gathered by the Native occupants of the site; the plants that they ate; and the wood that they used for fuel and implements. Stone tools and tool-making debris reflect the kinds of stone implements they used, how they used them, and the various ways in which the tools were made.

The archaeological investigation established preliminary boundaries and content for the Mukilteo Shoreline Site. Geoarchaeological tests helped investigators deduce the physical framework of the site, establish the depositional context for the shell midden, and construct a preliminary landform history.

Testing suggests that the Mukilteo Shoreline Site was an important year-round occupation that played a prominent role in the settlement systems of Native American communities. Elliot Point would have been a valuable place not only for the year-round availability of certain subsistence resources, but also as a strategic landform near the intersection of south Puget Sound, the protected tidewaters east of Whidbey Island, the entrance to Hood Canal, and the exit to the Strait of Juan de Fuca through Admiralty Inlet. The site is also near the mouth of the Snohomish River, which provides a transportation route east to the foothills, the Cascade crest, and beyond. The U.S. Air Force determined the site is eligible under NRHP Criterion D, for its potential to provide information important in understanding history or prehistory.

### **Point Elliott Treaty Site**

The Point Elliott Treaty Site (designated 45SN108 by DAHP) is the location where the 1855 treaty between the U.S. government and the Native American tribes of northern Puget Sound was signed. The treaty caused extreme changes for Native American people by divesting them of their lands and establishing the reservation system. At the same time, the treaty is a legal document that establishes the sovereignty of independent tribal governments, and it is a symbol of survival. Work associated with the Point Elliott Treaty Site included archival research, coordination with the tribes, and oral history interviews with tribal members. Although exact locations where 1855 Point Elliott Treaty events occurred remain uncertain, the size of the treaty gathering, nature of the landform, and other factors suggest that the site boundary should encompass the entire original geography for the point, which ended east of where the Tank Farm Pier is today or just past Japanese Gulch.

FTA has determined the Point Elliott Treaty Site is eligible for listing as a historic site in the NRHP under Criterion A for its association with the history of Indian/white relations, and under Criterion B for its association with prominent political leaders of the day, Governor Isaac Stevens, and a number of Indian leaders including Seattle, Patkanim, Goliah, and Chowitshoot. The site is also eligible as an archaeological site under Criterion D for its potential to provide information important in understanding history and prehistory.

### **Old Mukilteo Townsite**

Archaeological investigations associated with the Mount Baker Terminal in 2006 provided physical evidence of the community's history in the form of buried historical

archaeological sites. The Old Mukilteo Townsite (designated 45SN404 by DAHP) studies offer unique insights into the town's early community structure, commercial systems, demographics, and lifeways, while recovery of a few clay tobacco pipe fragments, a bead, and a stone pendant may be evidence of Mukilteo's trading post period. Observed historical materials also included deteriorated lumber, burned brick, and historical artifacts, as well as remains identified through historical research as the Crown Lumber Company store and butcher shop. This site has previously been determined eligible by the U.S. Air Force under Criterion D for the property's potential to provide information important in understanding history, and under Criterion A for its association with Mukilteo's early development.

### **Japanese Gulch Site**

The Japanese Gulch Site (designated as 45SN398 by DAHP) was also identified in 2006. It is evidence of early 20th century Japanese mill workers who resided in the racially segregated Mukilteo Japanese Gulch settlement.

The early city directories did not include the Japanese workers, who were evidently employed by the Mukilteo Lumber Company from the beginning of its operation. Newspaper accounts indicate that the mill had hired at least 30 laborers of Japanese ancestry to work in the yard by February of 1904, and reported that other Japanese crews were planned. Caucasian workers initially threatened to leave the company if the Japanese workers were not dismissed, but their protest had little effect. The numbers of Japanese employed at Mukilteo Lumber Company continued to rise and later historical accounts suggest that the number had increased to 150 by 1905.

This site has previously been determined eligible by the U.S. Air Force under Criterion D for the property's potential to provide information important in understanding history, and under Criterion A for its association with the introduction of Japanese immigrant labor to the Puget Sound area.

### **Mukilteo Light Station**

This lighthouse complex, consisting of 11 buildings and structures, is listed in the NRHP. The lighthouse, two keepers' residences, and a coal storage building were constructed in 1906. A two-bay garage, concrete fence posts, sidewalks, a seawall, ladder storage, water basin, and triangle alarm were added before 1935 and are contributing elements.

The Mukilteo Light Station is listed as being historically significant under Criterion A for its association with the maritime history of Puget Sound. It is also significant under Criterion C as a well-preserved complex of buildings and structures typical of those produced by the federal Light House Board in the Pacific Northwest during the late 19th and early 20th centuries.

## **4.6.4 Adverse Effects**

For historic properties, adverse effects occur when an undertaking may alter, directly or indirectly, any of the characteristics that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Examples of adverse

effects include physical destruction or damage; restoration, rehabilitation, repair, or other alteration inconsistent with the Secretary's *Standards for the Treatment of Historic Properties*; relocation of a property from its historic location; change in the character of a property's use or physical features of the setting; introduction of visual, atmospheric, or audible elements that diminish the property's integrity; neglect that causes deterioration; and transfer, lease, or sale of property out of federal ownership or control without adequate preservation controls.

For archaeological sites, adverse effects due to construction are considered permanent because they can damage artifacts and damage the integrity of association among artifacts and cultural and natural sediments. Disruption of these relationships severely limits the ability of archaeologists to interpret a property in a meaningful manner. Because the archaeological sites identified in the APE lie beneath soils used as fill in more recent times, a disruption is most likely to occur when excavation is deep enough to penetrate the protective fill layer.

Archaeological investigations suggest limited potential for encountering other buried archaeological material, aside from the sites that are already recorded. In general, much of modern Elliot Point consists of a filled lagoon or wetland—landforms that would not have been conducive to pre-Euroamerican contact or Native American residential activities. The presence of lagoon or wetland deposits is a good indicator that concentrated pre-contact cultural material, like a shell midden, would not occur. The limited excavations at the Japanese Gulch Site, located on delta deposits, did not identify any pre-contact cultural material or deposits. The original shoreline was at the base of the slopes of Japanese Gulch until the railroad was constructed.

Table 4.6-1 provides a summary of adverse effects.

**Table 4.6-1. Adverse Effects by Alternative**

Alternative	Project Elements	Site Affected
<b>No-Build</b>	Buildings and utilities	45SN393 Mukilteo Shoreline Site
<b>Preferred Alternative</b>	No features within midden but construction above	45SN393 Mukilteo Shoreline Site
	Stormwater and utilities	45SN404 Old Mukilteo Townsite
	First Street/SR 525 relocation and retaining walls	45SN404 Old Mukilteo Townsite
<b>Existing Site Improvements</b>	Buildings	45SN393 Mukilteo Shoreline Site
	Utilities	45SN393 Mukilteo Shoreline Site
	Stormwater and utilities	45SN404 Old Mukilteo Townsite
	First Street/SR 525 relocation and retaining walls	45SN404 Old Mukilteo Townsite
<b>Elliot Point 1</b>	No features within midden but construction above	45SN393 Mukilteo Shoreline Site
	Stormwater and utilities	45SN404 Old Mukilteo Townsite
	First Street/SR 525 relocation and retaining walls	45SN404 Old Mukilteo Townsite
	Japanese Creek daylighting and nearby construction elements	45SN398 Japanese Gulch Site

### **No-Build Alternative**

The No-Build Alternative would have an adverse effect on the Mukilteo Shoreline Site, but would avoid effects on any of the other historic properties. The replacement of the passenger building would likely require below-ground seismic and utility upgrades, which could intrude upon the northern edge of the Mukilteo Shoreline Site. The Mukilteo Shoreline Site has been identified at the intersection of Front Street and SR 525 at a shallow depth.

### **Preferred Alternative**

The Preferred Alternative moves the terminal and its facilities to the Mukilteo Tank Farm parcel, which coincides in part with the east end of the Mukilteo Shoreline Site (45SN393). The Preferred Alternative places all project elements requiring excavation outside the midden. Some smaller buildings, paved roadways, holding lanes, and other parts of the multimodal facility would be constructed above the midden. All project elements above the midden will be built on a protective layer of fill to avoid intersecting the archaeological site. Because the project could still encounter unidentified archaeological resources, WSDOT and FTA have consulted under Section 106 to define the measures the project will take to protect the resource and resolve any adverse effects to the midden site, should they occur.

Through the Section 106 consultations, WSDOT and FTA defined a collaborative planning and cultural design process to guide further development of the project in collaboration with affected Native American tribes. This process will help define potential design features and themes to help commemorate the Mukilteo Shoreline Site as well as the Point Elliott Treaty Site. During final design, the project will continue a collaborative process to further develop the project's commemorative and interpretive features, which include potential viewpoints, a "long house" design concept for the passenger building, and other design concepts to be considered for project facilities. However, the Preferred Alternative would not alter any of the characteristics that make the Point Elliott Treaty Site eligible for the NRHP, and aside from the geographic setting, there are no remaining features related to the site's historic significance.

The Preferred Alternative overlaps the known limits of the Old Mukilteo Townsite (45SN404). Maximum depth of excavation in this area will be approximately 7 feet below finished grade for the installation of utilities. The mechanically stabilized earth walls along First Street within the site boundary will require 2 to 3 feet of excavation, and an approximate maximum width of 11 feet at each footing. A stormwater treatment pond will be located near First Street and Park Avenue, intersecting the Old Mukilteo Townsite. The size and depth of this pond has not yet been determined, but could intersect the Old Mukilteo Townsite.

FTA and WSDOT determined excavation will have an adverse effect on the Old Mukilteo Townsite and may have an adverse effect on the Mukilteo Shoreline Site. DAHP concurred with an adverse effect finding for the project under Section 106. FTA and WSDOT then undertook consultations under Section 106 to develop a Memorandum of Agreement (MOA) defining the measures the project will take to resolve adverse effects.

By limiting excavation and using fill to establish a protective layer, the Preferred Alternative would avoid or minimize adverse effects to the Mukilteo Shoreline Site, and this also reduces potential effects to portions of Mukilteo Shoreline Site. The MOA describes the measures and commitments the project will make to resolve adverse effects to historic properties, which include a resource management plan to guide actions during future design and construction activities. The Draft MOA is included as *Appendix J* to this EIS.

### **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative has the potential to damage the Mukilteo Shoreline Site because the replacement ferry passenger/maintenance building at the northern edge of the site is expected to exceed the dimensions of the foundations for the existing building or Ivar's restaurant, and additional utility connections and upgrades would be needed. Excavation for utilities and stormwater features is anticipated near the intersection of Front Street and Park Avenue, where parts of the Mukilteo Shoreline Site and the Old Mukilteo Townsite are located.

New roadways and holding lanes would likely be built on fill and so are not expected to adversely affect subsurface material, but retaining walls would be needed for the First Street extension and the south end of the employee parking area, which could adversely affect historic archaeological material associated with the Old Mukilteo Townsite. The transit center, stormwater facilities, or other utilities could also be in areas with archaeological materials.

### **Elliot Point 1 Alternative**

The Elliot Point 1 Alternative would move the terminal east of the boundaries of the Mukilteo Shoreline Site and the Old Mukilteo Townsite, with several of the associated facilities built over water. An adverse effect on the Old Mukilteo Townsite could result from excavation for a stormwater pond, utilities, and the retaining wall needed for the First Street extension. The Japanese Gulch Site could be adversely affected by daylighting Japanese Creek, installing a nearby sanitary sewer pump station/generator, and extending First Street.

The alternative would place fill and a roadway above the eastern edge of the Mukilteo Shoreline Site, and the site layout allows most utilities to be routed around the midden. The alternative's footprint overlaps the least with the boundaries of the site. Similar to the Preferred Alternative, fill would be used to avoid disturbing the midden.

## **4.6.5 Indirect and Secondary Impacts**

Indirect and secondary impacts are project activities or plans that could change the qualities for which historic resources are listed or considered eligible for the NRHP, but are not direct impacts (such as right-of-way acquisitions). These are caused by the project, but later in time or farther removed in distance from the APE, and are reasonably foreseeable. For historic resources, these impacts may include visual, air quality, noise, or traffic impacts that could cause changes to the historic setting or use of the historic resources. The existing terminal site would be available for

redevelopment with the Preferred Alternative and the Elliot Point 1 Alternative. The redevelopment of some portions of the existing terminal site could encounter identified archaeological sites.

#### **4.6.6 Cumulative Impacts**

Cumulative impacts result from the incremental effect of the proposed action when added to those of other past, present, and reasonably foreseeable future actions, regardless of the agency (federal or non-federal) or person that undertakes other such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

Past and present development has removed or altered the character of many cultural resources in the central Puget Sound region during the last 150 years. The development and subsequent loss of character or integrity of historic properties follows a national trend, which lead to the passage of federal and state regulations to protect these resources. In 1966, Congress passed the NHPA to slow the trend of loss. Washington State and Snohomish County also have regulations to protect cultural resources and to consider effects on properties eligible for listing in the Washington Historic Register or in the Snohomish County Register of Historic Places. Although many resources have already been lost, the rate of attrition is slowing because of federal, state, and local protections and an increasing public interest in preserving the nation's cultural heritage for future generations.

Although the mitigation measures described below would greatly minimize this project's impacts on historic resources, this project and future development along the Mukilteo shoreline could contribute to cumulative impacts on historic resources in the area. As discussed in *Chapter 2 Alternatives*, the U.S. Air Force may transfer ownership of the Mukilteo Tank Farm to the Port of Everett. The U.S. Air Force land conveyance is independent of the Mukilteo Multimodal Project. It is permitted by Section 2866 of the Military Construction Authorization Act for Fiscal Year 2001 (division B of the Spence Act; 114 Stat. 1654A-436, as amended by Section 2858 of the National Defense Authorization Act for Fiscal Year 2002 [PL 107-107]). Thus, regardless of the alternative selected for this project, a portion of the Mukilteo Tank Farm may be available for redevelopment. This redevelopment could cause impacts to historic and cultural resources, although a preservation covenant would be included with the conveyance of property to the Port of Everett.

#### **4.6.7 Mitigation Measures for Adverse Effects**

FTA has determined that construction and operation of this project could cause adverse effects on historic properties and with WSDOT has consulted with DAHP, ACHP, affected tribes, and other interested parties, pursuant to the NHPA. The project's MOA and an associated resource management plan will dictate the specific commitments and approach to resolve adverse impacts on historic properties for the Preferred Alternative. While this Final EIS addresses impacts under all of the alternatives, the MOA applies specifically to the Preferred Alternative. Should a different alternative be advanced, FTA and WSDOT and the consulting parties would develop an MOA specific to that alternative.

**Preferred Alternative**

A signed MOA would need to be in place before the project can be approved by FTA. The draft that is currently under consideration by the consulting parties is provided in *Appendix J*. It calls for the continued participation of the consulting parties in the development of the project, and it defines measures to:

- Guide the design and construction of the project to avoid excavation within the limits of the Mukilteo Shoreline Site
- Develop the project with cultural design elements to recognize the importance of the Point Elliott Treaty Site as a traditional place and a site of historic and cultural significance
- Guide project design and archaeological research for areas affecting the Old Mukilteo Townsite, and address the Preferred Alternative's unavoidable excavation impacts
- Develop and implement an archaeological monitoring plan, a data recovery plan, a curation plan, an inadvertent discovery plan, and a plan specific to the potential recovery of human remains
- Make public findings of archaeological investigations conducted under the resource management plan
- Allow interested and affected tribes to participate in the project's archaeological monitoring activities
- Document compliance with the terms of the MOA

**No-Build Alternative**

For this alternative, impacts would be avoided or minimized if the project would maintain the same foundation location for the passenger building, and if seismic and utility upgrades can be accomplished without excavating into the midden area. If this is not possible, the project would apply avoidance, minimization, and data recovery measures for the affected resources, in consultation with DAHP and other interested parties.

**Existing Site Improvements Alternative**

For areas where excavation or other construction is expected to encounter archaeological materials, the Existing Site Improvements Alternative would apply similar avoidance, minimization, and data recovery measures as those described for the Preferred Alternative. New building construction, trenches, drains, and underground utilities would be sized and located to minimize impacts. All in-ground work would be monitored within the boundaries of identified archaeological sites or where pre-construction surveys identify that archaeological deposits may be encountered. To the extent possible, subsurface work in archaeological sites would take place in previously disturbed areas.

### **Elliot Point 1 Alternative**

The Elliot Point 1 Alternative would apply similar avoidance, minimization, and data recovery measures as described for the Preferred Alternative. New building construction, trenches, drains, and underground utilities would be sized and located to minimize impacts. All in-ground work would be monitored in areas within the identified archaeological sites or where pre-construction surveys indicate archaeological deposits may be encountered. To the extent possible, subsurface work in archaeological sites would take place in previously disturbed areas.

## **4.7 Air Quality**

Air quality refers to the level of pollutants in the atmosphere. Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants degrade the atmosphere by reducing visibility, damaging property, reducing the productivity or vigor of crops or natural vegetation, and/or harming human or animal health. Federal and state regulations prohibit air pollution and require an analysis of air quality impacts for proposed projects.

Vehicle emissions from traffic congestion in the Puget Sound area contribute several air pollutants. Air pollutants affect public health, especially the health of the young, the elderly, and those with sensitive respiratory conditions. The major pollutants of concern in the Puget Sound region include carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), particulate matter less than 10 microns in size (PM<sub>10</sub>), particulate matter less than 2.5 microns in size (PM<sub>2.5</sub>), and ozone (O<sub>3</sub>).

### **4.7.1 Overview of Analysis and Regulatory Context**

Several state and federal regulations provide for the protection of air quality.

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants determined harmful to public health and the environment. The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, as well as damage protection for animals, crops, vegetation, and buildings.

Under the CAA, the EPA has set NAAQS for six “criteria pollutants”: CO, PM<sub>10</sub>, PM<sub>2.5</sub>, O<sub>3</sub>, sulfur dioxide (SO<sub>2</sub>), lead, and nitrogen dioxide (NO<sub>2</sub>). The NAAQS specify maximum allowable concentrations for these criteria pollutants. The standards applying to transportation projects are summarized in Table 4.7-1.

Federal regulations require that projects conform to and do not exceed the NAAQS. These standards were established to protect human health and welfare. “Maintenance areas” are locations that previously did not meet the NAAQS, but with air quality improvement these areas now meet the standards.

Other regulations direct the EPA to implement policies and regulations that will ensure acceptable levels of air quality.

The CAA and the Final Transportation Conformity Rule apply to proposed transportation projects. The CAA requires federally funded transportation projects to conform to applicable State Implementation Plans.

**Table 4.7-1. Summary of National Ambient Air Quality Standards**

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Averaging Time	
Carbon Monoxide (CO)	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>(1)</sup>	No Secondary Standard	
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>(1)</sup>	Same as Primary Standard	
Lead (Pb)	0.15 µg/m <sup>3</sup>	Rolling 3-Month Average	Same as Primary Standard	
	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary Standard	
Nitrogen Dioxide (NO <sub>2</sub> )	53 ppb <sup>(2)</sup>	Annual (Arithmetic Average)	Same as Primary Standard	
	100 µg/m <sup>3</sup>	1-hour <sup>(3)</sup>		
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	1-hour <sup>(4)</sup>	Same as Primary Standard	
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <sup>(5)</sup> (Arithmetic Average)	Same as Primary Standard	
	35 µg/m <sup>3</sup>	24-hour <sup>(6)</sup>	Same as Primary Standard	
Ozone (O <sub>3</sub> )	0.075 ppm	8-hour <sup>(7)</sup>	Same as Primary Standard	
	0.12 ppm	1-hour <sup>(8)</sup>	Same as Primary Standard	
Sulfur Dioxide (SO <sub>2</sub> )	0.03 ppm	Annual (Arithmetic Average)	0.5 ppm	3-hour <sup>(1)</sup>
	0.14 ppm	24-hour <sup>(1)</sup>		
		75 ppb <sup>(9)</sup>	1-hour	None

**Notes:**

<sup>(1)</sup> Not to be exceeded more than once per year.

<sup>(2)</sup> The official level of the annual NO<sub>2</sub> standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

<sup>(3)</sup> To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb.

<sup>(4)</sup> Not to be exceeded more than once per year on average over 3 years.

<sup>(5)</sup> To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

<sup>(6)</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup>.

<sup>(7)</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.

<sup>(8)</sup> (a) EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding").

(b) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.

<sup>(9)</sup> To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.

ppm = parts per million; ppb = parts per billion

The Final Conformity Rule requires that projects do not:

- Cause or contribute to any new violation of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS in any area; or
- Delay timely attainment of any NAAQS or any required interim emission reductions or other milestones in any area.

## **Air Toxics**

EPA regulates air toxics, which are pollutants known or suspected to cause cancer or other serious health effects. The CAA identified 188 air toxics, 21 of which result from mobile sources. EPA has not established ambient standards for Mobile Source Air Toxic (MSAT) levels, so non-attainment areas have not been designated and conformity requirements for MSAT emissions have not been promulgated.

Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

EPA has identified seven hazardous MSATs that have significant contributions from mobile sources: acrolein; benzene; 1,3-butadiene; diesel particulate matter, formaldehyde, naphthalene, and polycyclic organic matter. The health risk from MSAT exposure is related to cancer and long-term ailments, not emergent disease, like asthma attacks. Unlike pollutants such as ozone and carbon monoxide that have emission limits and are subject to transportation conformity, there are no emission standards for MSATs. While modeling tools can estimate MSAT emissions from a project, information regarding MSATs is still evolving and there are limited tools for determining project-specific health outcomes (cancer risk) from MSAT exposure.

## **4.7.2 Affected Environment**

### **Puget Sound Regional Air Quality Trends**

For air quality purposes, the study area for the project encompasses the four-county urban area. Air quality in the study area is managed by EPA, Ecology, and the Puget Sound Clean Air Agency (PSCAA).

The Puget Sound area encompasses a large portion of the Everett-Seattle-Tacoma urban area, including surrounding communities such as Mukilteo. Prior to 1996, the Puget Sound area was classified as a non-attainment area for CO because monitoring sites showed that CO concentrations had exceeded the NAAQS. In 1996, it was reclassified as a maintenance area for CO, meaning that the area met NAAQS and a maintenance plan was implemented to prevent the area from being reclassified to non-attainment.

Another pollutant of interest in the Puget Sound region is particulate matter or dust. Standards regulate the portion of dust that is less than 10 microns in size; stricter standards apply to particles less than 2.5 microns. Particles of these sizes are small enough to enter the lungs when inhaled. The region is in attainment (meets NAAQS)

for both sizes of particulate matter; therefore, no project-level analysis for particulate matter is required.

Over the past 20 years, air quality in the region has improved, even with increases in both population and vehicle miles traveled. Much of the improvement in air quality is due to improvements made to emission controls on motor vehicles, the vehicle Inspection and Maintenance (I&M) program administered by Ecology, and the retirement of older, more polluting vehicles. However, over the past several years, levels of emissions of fine particulates and ozone have been on the rise, and new concerns such as air toxics, visibility, and climate change have grown.

NO<sub>x</sub> are a concern in the region due to their role in the formation of ozone (along with volatile organic compounds in the presence of sunlight); however, emissions of this pollutant have been dramatically reduced in the region.

Because of EPA's more stringent standards for both ozone and fine particulates, the region could soon be designated as non-attainment for these pollutants.

Emissions of carbon monoxide, sulfur oxides, and lead are below levels of concern in the region. The National Air Toxic Assessment is an ongoing comprehensive evaluation of air toxics conducted by EPA. It indicates that air toxics risk in the Puget Sound region is similar to other major urban areas. Voluntary programs, such as the local Diesel Solutions Program and Ecology's Clean Cities Program, seek to reduce toxic diesel emissions by encouraging public and private fleet operators to use ultra-low sulfur diesel and/or to install retrofit devices to filter or oxidize vehicle exhaust (PSCAA 2005). Ecology and EPA support other voluntary programs that encourage diesel emission reductions.

## **Existing Meteorological Conditions**

Ambient air quality is a function of many factors, including climate, topography, meteorological conditions, and the production of airborne pollutants by natural or artificial sources.

The project site is subject to the same meteorological conditions that affect the Puget Sound. This region has a marine climate, dominated by cool, moist winds coming off the ocean. Temperature inversions are common throughout the Puget Sound area in the fall and winter, and these conditions tend to trap and concentrate pollutants. In most cases, inversions have an upper lid at an altitude between 1,000 and 3,000 feet, occur during the night, and break up by early afternoon. The project is close to sea level, less than 1,000 feet elevation, and is therefore within an area subject to inversions.

During the summer, winds typically tend to be light and variable (less than 10 miles per hour). Persistent high-pressure cells often dominate summer weather, creating stagnant air conditions. This weather pattern sometimes contributes to the formation of photochemical smog. Because of its location north of the major urban centers of Seattle and Tacoma and the northerly winds during the summer months, the Mukilteo area generally experiences fewer instances of stagnant air conditions.

Although the Puget Sound lowland is the most densely populated and industrialized area in Washington, there is sufficient wind most of the year to disperse air

pollutants. Air pollution is usually most noticeable in the late fall and winter, under conditions of clear skies, light wind, and a sharp temperature inversion, when particulates and CO from wood stoves and vehicle sources can be trapped close to the ground. If poor dispersion persists for more than 24 hours, PSCAA can declare an air pollution episode or local impaired air quality.

Ecology issues a daily Air Quality Index (AQI) using forecast meteorology and real-time pollutant monitoring. There have been several instances of air quality advisories categorizing air pollution in the region as moderate or unhealthy for sensitive groups.

### **Attainment Status and Regional Air Quality Conformity**

The State Implementation Plan (SIP) directs that transportation activities may not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. As detailed below, the project is not expected to create any new violations or increase the frequency of an existing violation of the CO standard; it would conform with the SIP and the requirements of the federal CAA and the Washington Clean Air Act. As a regionally significant project, the proposed project is included in the current regional transportation plan (RTP), and in the Central Puget Sound Regional 2007-2010 Transportation Improvement Program (TIP), which lists all current transportation projects (PSRC 2009). The RTP and the TIP meet the conformity requirements identified by federal regulators.

## **4.7.3 Long-Term Environmental Impacts**

### **Regional Impacts**

For all alternatives, the project conforms with the SIP because it does not:

- Cause or contribute to any new violations of the NAAQS
- Increase the frequency or severity of any existing violation of the NAAQS
- Delay the timely attainment of the NAAQS

Improvements to the transportation system that are independent of this project would reduce emissions from vehicles and improve air quality in the study area. Programs and trends, such as the Puget Sound I&M program, stricter vehicle emission standards and higher fuel efficiency for new cars, and gradual replacement of older, more polluting vehicles with newer, cleaner cars, are expected to continue to reduce vehicle emissions.

Voluntary programs also are expected to contribute to emissions reductions. The WSDOT Ferries Division participates in voluntary emission reduction programs, such as the PSCAA *Diesel Solutions* Program. WSDOT has switched its fleet to low-sulfur diesel fuel and biodiesel to reduce emissions and is evaluating methods for reducing fuel consumption, including reducing travel speeds and performing engine retrofits. WSDOT also plans to replace the current 124-vehicle vessels operating on the Mukilteo-Clinton route with 144-vehicle vessels, which would result in shorter queues and help reduce the amount of idling in the holding areas. Newer generation ferries also have engines that reduce emissions, which will also help to improve future air quality.

According to PSRC's *Vision 2040*, "regional air pollution trends have generally followed national patterns over the last 20 years, with the level of criteria air pollutants decreasing over the last decade to levels below the federal standards" (PSRC 2010). In general, the air quality in the central Puget Sound region has either remained steady or improved over the last 5 years. Cleaner cars, industries, and consumer products have contributed to cleaner air throughout much of the United States, including in the central Puget Sound region, and this trend is likely to continue.

All Build alternatives will change the location of the ferry terminal, but the number of sailings will remain the same as today. The cumulative effects of the ferry emissions will also remain the same as today or get better over time. The same is true for emissions from vehicles waiting for the ferry. In the worst-case scenario, about 20 percent of the vehicles will idle while waiting for the ferry. These emissions will be reduced as WSDOT adds larger capacity vessels and as vehicles become cleaner over time.

The predominant wind direction in this area is from the southwest in the summer and northwest in the winter. This means that emissions from the new terminal location would typically be dispersed away from local residents.

As described in more detail below, worst-case operational CO concentrations were modeled for the No-Build Alternative and the Build alternatives. No exceedance of the 35 ppm 1-hour average or the 9 ppm 8-hour average NAAQS for CO would occur at any receptor location.

Regional impacts were considered for the Central Puget Sound CO maintenance area. Impacts during construction were evaluated on a regional scale, including the Central Puget Sound CO maintenance area.

As a regionally significant project, the proposed project is included in the current RTP and in the TIP, which meet the conformity requirements identified by federal and state regulations for CO.

Ozone concentration was not modeled for this project because it is modeled on a regional scale by the PSRC, and is not likely to be an impact. The primary source of air pollution in the project area is vehicle emissions. The presence of traffic queues at the existing toll booths and vehicles traveling to the ferry may result in short-term periods of high vehicle emissions and elevated CO concentrations. However, the low-rise residential and commercial structures do not trap emissions, reducing the likelihood of elevated pollutant concentrations.

## **Localized Impacts**

Because the project area is in a maintenance area for CO, a project-level analysis must verify that no localized impacts would cause, contribute to, or worsen a violation of the NAAQS. The analysis calculates CO concentrations around selected intersections, which are chosen based on their high levels of traffic volumes and delay.

Potential long-term air quality impacts were estimated according to the guidelines provided in the EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (EPA 1992a). This analysis (called a hot-spot analysis) predicts CO concentrations

and compares air quality conditions under various scenarios to the NAAQS for CO at selected locations. The NAAQS provide two types of standards for CO: an 8-hour standard of 9 ppm and a 1-hour average standard of 35 ppm.

The analyzed sites were the signalized intersections that would be directly affected by this project, as well as those indirectly affected and within the project vicinity.

Air quality was modeled for the existing conditions in 2010, the year of opening (2019), and the horizon year (2040) for all the alternatives.

Five intersections were analyzed for CO impacts:

- SR 525/5th Street (all alternatives)
- SR 525/First Street (all Build alternatives)
- West Driveway/First Street (Elliot Point 1 Alternative)
- East Driveway/First Street (Elliot Point 1 Alternative)
- Toll booth and First Street (Preferred Alternative)

As shown in Table 4-7.2, the results for the worst-case receptor are below the 1-hour average NAAQS for CO of 35 ppm and below the 8-hour average standard of 9 ppm. This confirms that the air quality would improve within the vicinity of the project area, resulting in no exceedance of the CO air quality standards in 2040.

**Table 4-7.2. Maximum Predicted CO Concentrations (ppm)**

Alternatives	Intersections									
	SR 525/5th Street		SR 525/First Street		West Driveway/First Street		East Driveway/First Street		Toll Booths and First Street	
	1 hr	8 hr	1 hr	8 hr	1 hr	8 hr	1 hr	8 hr	1 hr	8 hr
2010 (Existing)	5.1	4.5								
2019 No-Build	4.2	3.8								
2019 Existing Site Improvements	4.2	3.8	4.3	3.9						
2019 Elliot Point 1	4.2	3.8	4.3	3.9						
2019 Preferred Alternative	4.2	3.8	3.9	3.6					3.7	3.5
2040 No-Build	4.8	4.3								
2040 Existing Site Improvements	4.8	4.3								
2040 Elliot Point 1	4.8	4.3	4.3	3.9	4.2	3.8	4.2	3.8		
2040 Preferred Alternative	4.8	4.3	4.3	3.9						

Note: Gray cells indicate that the intersection does not exist under a given alternative.

## Mobile Source Air Toxic Emissions in the Project Area

MSAT emissions are discussed qualitatively for the project because operations are not expected to change among alternatives. For each alternative in this EIS, the amount of MSATs emitted would be proportional to the vehicle miles traveled

(VMT), assuming that other variables such as fleet mix are the same for each alternative. Because the estimated VMT under each of the alternatives is the same, there would be no appreciable difference in overall MSAT emissions among the alternatives. Also, regardless of the alternative chosen, MSAT emissions would be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050.

Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures; however, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future.

Some public comments on the Draft EIS expressed concerns that areas beyond the holding area would be negatively affected by air quality changes due to the project. However, the standards used to assess emissions of any kind, including criteria pollutants such as carbon monoxide, as well as MSATs, are based on locations with the highest concentrations of operating vehicles. For areas that are more removed from the emissions sources (such as the surrounding inland areas of Mukilteo), the effects would be even lower than the worst case "hot spot" locations modeled.

Similarly, some comments also expressed concerns for workers who may be exposed to higher levels of emissions in their daily work, due to vehicle emissions during loading and unloading, as well as from the ferries themselves. Since the volume of vehicles and the ferries operations remain the same under the No-Build Alternative and the Build alternatives, there would be no additional impact for any of the Build alternatives. As part of its ongoing programs at an agency-wide level, WSDOT's health and safety plans will continue to incorporate best practices to help reduce potential negative effects to workers. As cleaner ferry and vehicle engines continue to replace older models, the potential exposure to emissions will also continue to be reduced.

#### **4.7.4 Construction Impacts**

Construction activities typically associated with roadway projects can temporarily generate particulate matter (mostly dust) and small amounts of other pollutants. These emissions are often associated with earthwork and demolition activities. If uncontrolled, particulate matter would also be generated by construction trucks entering roadways, and depositing dust and mud on paved streets.

Heavy trucks, barges, and construction equipment powered by gasoline and diesel engines would generate CO and NO<sub>x</sub> in exhaust emissions. If construction traffic were to reduce the speed of other vehicles in the area, emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site. In addition, people near asphalt paving operations may detect temporary odors. These odors would decrease with increased distance from the source.

Construction activities would include demolition of pavement and bridge structures, earthwork, new bridge construction, and new paving. Equipment to be used for construction would include pile-driving equipment, truck cranes, vibratory oscillator, dump trucks, loaders, excavators, and typical paving equipment such as graders, asphalt

pavers, and rollers. The air emissions from these types of construction projects would be slightly greater for the Elliot Point alternatives because they require more fill and other materials than the No-Build and the Existing Site Improvements alternatives.

PM<sub>10</sub> emissions may be associated with project construction, particularly for earthwork or demolition activities. PM<sub>10</sub> emissions can vary from day to day, depending on the level of activity, specific operations, and weather conditions. PM<sub>10</sub> emissions depend on soil moisture, silt content of soil, wind speed, and amount and type of equipment in operation. Larger dust particles settle near the source, while fine particles are dispersed over greater distances from the construction site.

PM<sub>10</sub> emission from construction activities is noticeable if uncontrolled. Mud and particulates from trucks can be noticeable, particularly if construction trucks travel on local streets.

Burning would not be allowed in the project area, so there would be no contribution of particulate matter from burning.

#### **4.7.5 Indirect and Secondary Impacts**

The project would produce indirect impacts on air quality from two sources: 1) primarily from trucks hauling construction materials to and from the SR 525 corridor, and 2) particulate release from excavation and trucking of fills from borrow sites outside the project's construction zone.

#### **4.7.6 Cumulative Impacts**

##### **Historical Trend**

According to PSRC's *Transportation 2040*, "regional air pollution trends have generally followed national patterns over the last 20 years, with the level of criteria air pollutants decreasing over the last decade to levels below the federal standards" (PSRC 2010). In the same document, PSRC points out that CO levels have decreased substantially in the region, in large part because of federal emission standards for new vehicles and the gradual replacement of older, more polluting vehicles. Additionally, improvements in fuels, inspection programs, and traffic control measures have also helped to decrease CO emissions. The central Puget Sound region has designated maintenance areas for CO and particulate matter. The region is in attainment for all other criteria pollutants. In general, the air quality in the central Puget Sound region has either maintained or seen improvements over the last 5 years. Cleaner cars, industries, and consumer products have contributed to cleaner air throughout much of the United States, including in the central Puget Sound region; this trend is likely to continue.

##### **Impacts of the Project Alternatives**

The air quality analysis for PSRC's *Transportation 2040* considers the long-term cumulative impacts of air pollutant emissions by incorporating traffic forecasts for regionally significant projects in the region. This analysis includes traffic from this project, as well as future development such as the Sound Transit Mukilteo Station improvements and both residential and commercial development in the downtown

core. By including these projects in its RTP, PSRC has analyzed possible cumulative impacts associated with the project, and has not identified long-term regional cumulative air quality impacts.

Localized cumulative air quality impacts could result if other construction projects occur concurrently with construction for this project, and if construction detours and material haul routes are not well coordinated.

#### **4.7.7 Mitigation Measures**

##### **Mitigation for Long-Term Impacts**

The operation of the Build alternatives would not generate additional traffic, but would better serve the traffic that is expected to increase whether this project is built or not. The air quality analysis indicates that the Mukilteo Multimodal Project would not result in any significant adverse air quality impacts in the study area. Consequently, no operational impact mitigation measures are warranted or proposed.

##### **Mitigation for Construction Impacts**

###### ***Preferred Alternative***

For the Preferred Alternative, WSDOT would require contractors to develop a construction management plan to identify measures to mitigate air quality impacts. The plan would attempt to minimize roadway congestion and would be designed to conserve energy and reduce air emissions by limiting idling equipment, encouraging construction workers to carpool, and locating staging areas near work sites.

The construction management plan would encourage contractors to apply EPA's National Clean Diesel Campaign emission reduction strategies, including:

- Replace old vehicles or equipment with newer, cleaner models
- Maintain engines properly to burn fuel more efficiently
- Install diesel particulate filters, diesel oxidation catalysts, crankcase emission control devices, and/or new engine components
- Use technologies that provide amenities such as cabin heat and air conditioning without operating the main engine, allowing for reduced idling
- Use fuels such as ultra-low sulfur diesel, biodiesel, liquid petroleum gas, compressed natural gas, or liquefied natural gas

Fugitive dust emissions would be reduced by incorporating mitigation measures specified in the *Associated General Contractor of Washington Guidelines* into the construction specifications for the project. Possible mitigation measures to control fugitive dust emissions during construction are listed below (Associated General Contractors of Washington 1997).

- Spray exposed soil with water to reduce emissions of PM<sub>10</sub> and the deposition of particulate matter

- Minimize dust emissions during transport of fill material or soil by wetting down or covering the load
- Promptly clean up spills of transported material on public roads
- Locate construction equipment and truck staging areas away from residences, as practicable, and in consideration of potential impacts on other resources
- Provide wheel washers to remove particulate matter that would otherwise be carried off site by construction vehicles
- Cover dirt, gravel, and debris piles, as needed, to reduce dust and wind-blown debris
- Minimize on-site odors by covering loads of hot asphalt

### **Other Alternatives**

Construction mitigation for the No-Build, Existing Site Improvements, and Elliot Point 1 alternatives would be similar to the measures identified for the Preferred Alternative.

### **4.7.8 Conformity Determination**

This project meets project-level air quality conformity in accordance with state and federal regulations as follows:

- The project is included in PSRC's RTP.
- The project is included in the current TIP.
- The project meets the local hot-spot conformity requirements. Because the project has been included in the RTP and TIP modeling, it demonstrates conformity to the SIP. The project meets project-level conformity requirements because it would not cause any new NAAQS exceedance or worsen any existing one, and would not delay the timely attainment of any standard.

## **4.8 Hazardous Materials**

Hazardous material is a term describing a substance that may harm humans or the environment. Hazardous materials may be classified in different categories based on the laws and regulations that define their characteristics and uses. These classifications include hazardous waste, dangerous waste, hazardous substances, and toxic substances. Hazardous materials contamination refers to soil, sediment, or water that carry some level of toxic substance not normally found in the natural environment, typically due to an uncontrolled release of hazardous materials.

This section evaluates the impacts that existing or future hazardous materials could have on people and the environment, and discusses how the potential presence of existing hazardous materials could affect the construction or implementation of project alternatives. The section also describes measures to avoid or mitigate impacts.

### 4.8.1 Overview of Analysis and Regulatory Context

Numerous federal, state, and local laws; regulations; guidance documents; and policies govern the handling and disposal of hazardous materials and the remediation of media contaminated with hazardous materials. The most common federal and state laws and regulations pertaining to hazardous materials that apply to WSDOT projects are listed in Table 4.8-1. A detailed description of each law and regulation in this list is provided in the *Hazardous Materials Discipline Report*, which is an appendix to this EIS. Ecology's Model Toxics Control Act (MTCA) cleanup regulations (Chapter 173-340 WAC) and the Sediment Management Standards (SMS) (Chapter 173-204 WAC) regulate management and disposal of contaminated soil, groundwater, surface water, and sediment.

**Table 4.8-1. Laws, Regulations, Guidance Documents, and Policies Governing Handling, Disposal, and Remediation of Hazardous Materials**

<b>Federal Laws and Regulations</b>
Clean Air Act (CAA)
Clean Water Act (CWA)
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 USC §§ 9601 - 9675), the Superfund Amendments and Reauthorization Act (SARA), and All Appropriate Inquiries (AAI) (40 CFR Part 312)
National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Parts 61 to 71)
Occupational Safety and Health Act of 1970
Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984 (42 USC §§ 6901 – 6992k)
Toxic Substances Control Act (TSCA)
<b>State Laws and Regulations</b>
Clean Air Act and Local Air Agency Regulations
Dangerous Waste Regulations (WAC 173-303)
Dredged Material Management Program (RCW 79.105.510 and 520, WAC 332.30.166)
Model Toxics Control Act (MTCA) (RCW 70.105D) and MTCA regulations (WAC 173-340)
Sediment Management Standards (WAC 173-204)
Solid (Non-Dangerous) Waste Disposal (RCW 70.95, WAC 173-304)
Underground Storage Tank Statute (RCW 90.76) and Regulations (WAC 173-360)
Underground Utilities (RCW 19.122)
Washington Industrial Safety and Health Act (WISHA, RCW 49.17) and implementing regulations
Lead-Based Paint and Asbestos Work (WAC 296-62 Part I-1; WAC 296-65; WAC 296-155)
Hazardous Waste Operations and Treatment, Storage, and Disposal Facilities (WAC 296-62 Part P)
Safety Standards for Construction Work (WAC 296-155)
Wastewater Discharges to Ground (WAC 173-216)
Wastewater Discharges to Surface Waters (WAC 173-220)
Water Pollution Control Act (RCW 90.48), Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A), and Water Quality Standards for Groundwater of the State of Washington (WAC 173-200)

## 4.8.2 Affected Environment

The project area is defined as the footprint of all four project alternatives taken together. The hazardous materials study area surrounds and includes the project area and is the area within which hazardous materials, if released, might affect the project area. Figure 4.8-1 shows the boundaries of the project area and the study area and identifies sensitive receptors, which are areas with populations particularly sensitive to potential project-related releases of hazardous materials.

A total of 14 hazardous materials sites were identified in the study area, one of which is the Mukilteo Tank Farm. Figure 4.8-2 shows and Table 4.8-2 describes the sites and lists documented releases of hazardous materials based on past uses of hazardous materials at the sites and on remaining structures or facilities.

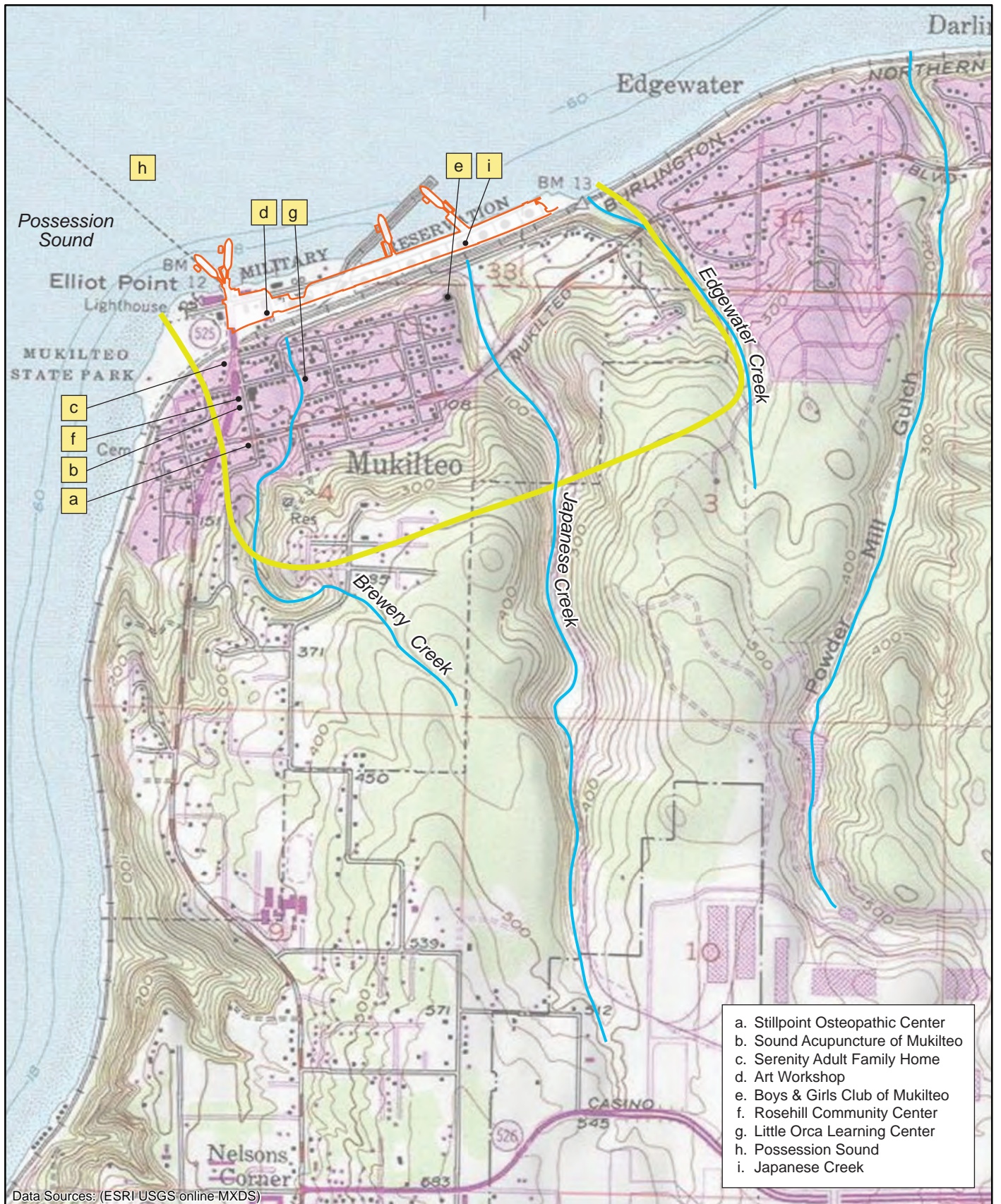
### Mukilteo Tank Farm

The Mukilteo Tank Farm straddles the city limits of Mukilteo and Everett. The property is bounded by Possession Sound to the north, Park Avenue to the west, the BNSF tracks to the south, and the Port of Everett Mount Baker Terminal to the east.

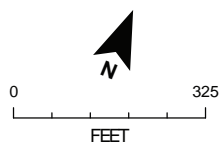
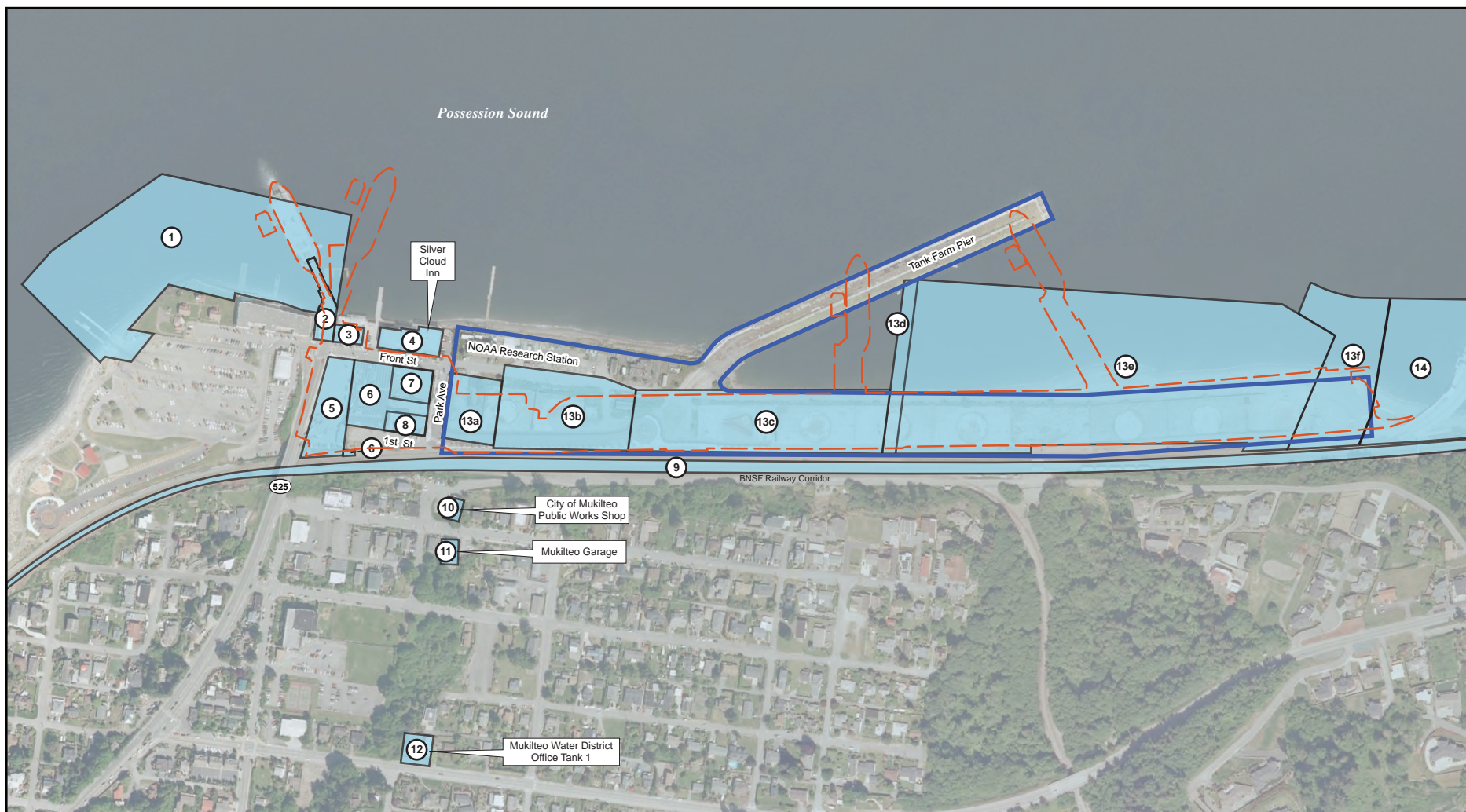
The Mukilteo Tank Farm consists of nearly 20 acres of upland property and the associated Tank Farm Pier. The upland portion of the site, about 12 feet above mean sea level, is graded and flat. A protective riprap wall, approximately 10 feet high, separates the site from Possession Sound, with tidal flats and intertidal beaches exposed north of the site during low tide. The site is enclosed in some places by an 8-foot-high fence topped with barbed wire and in others by 10-foot-high concrete secondary tank containment walls. A gated entrance to the site is located on Front Street.

Major stages in the development of the property that is now the Mukilteo Tank Farm are summarized in Table 4.8-3. The site was originally developed as a lumber mill at the turn of the 20th century. During World War II, the mill property was sold to the U.S. Army, which established the Mukilteo Explosives Loading Terminal for loading ammunition onto ships bound for the Pacific theater. On-site structures at the time included administration buildings, facilities for vehicle maintenance (using oil, diesel, gasoline, and lubricating oils), an ammunition repair shop, several railroad spurs running the length of the property, coal-fired equipment, a pile-retaining wall, and two piers used for ammunition loading.

In 1951, the U.S. Air Force acquired the Mukilteo Tank Farm and constructed a bulk fuel storage and transfer facility, which included modifying the western pier (now known as the Tank Farm Pier) to load and unload fuel from vessels to rail cars. The U.S. Air Force later demolished the eastern trestle pier. Fill material was added to much of the site. The facility began operating, in association with McChord Air Force Base, in 1953 and continued until 1973, supplying jet propellant and aviation gasoline fuels to military installations in the Pacific Northwest.



**Figure 4.8-1. Environmental Characteristics, Project Area, Sensitive Receptors, and Study Area**



- ① Hazardous Materials Site
- ▭ Tank Farm Property
- Project Area

Figure 4.8-2. Hazardous Materials Site Locations

**Table 4.8-2. Hazardous Materials Sites**

Site No.	Site Name	Description	Documented Releases or Past Uses of Hazardous Materials
1	City of Mukilteo	Waterfront property west of current terminal	Potential presence of lead-based paint, asbestos, polychlorinated biphenyls (PCBs), mercury, creosote-treated timber and piles, and sediment contaminated with creosote.
2	Port of Everett	Mukilteo terminal is currently located here	Potential presence of lead-based paint, asbestos, PCBs, mercury, creosote-treated timber and piles, and sediment contaminated with creosote.
3	Ivar's Real Estate	Property occupied by Ivar's restaurant	Potential presence of lead-based paint, asbestos, PCBs, mercury, creosote-treated timber and piles, and sediment contaminated with creosote.
4	Silver Cloud Inn	Hotel immediately adjacent to the project area	Previously remediated site. Two gasoline underground storage tanks existed on the property. The western tank was closed in place in 1983. The eastern tank was removed in 1998. Ecology issued a No Further Action <sup>1</sup> determination for the site in 1999.
5	WSDOT	Paved area already owned by WSDOT; primarily used for ferry holding	Potential presence of lead-based paint, asbestos, PCBs, and mercury.
6	A & J Enterprises	Paved area currently being used for ferry holding	Diesel fuel releases encountered in 2009. This property was a gas station from the late 1940s to the mid-1950s. Underground storage tanks are the likely source of the petroleum hydrocarbon contamination.
7	Ivar's Real Estate	Parking lot	Underground PCBs detected in 2009 at southern edge.
8	James Mongrain	Glass blowing manufacturing shop	Potential lead-based paint, asbestos, PCBs, and mercury.
9	BNSF Railway Corridor	Tracks adjacent to the project area	No available information indicates whether loading of hazardous materials, including petroleum products from the Mukilteo Tank Farm, occurred along BNSF tracks.
10	City of Mukilteo Public Works Shop	Building located about 260 feet south of the project area	Previously remediated site. Two underground storage tanks were located on the property. The tanks were removed in 1999 and all reasonably accessible contaminated soil was removed. Ecology issued a No Further Action <sup>1</sup> determination for the site in 2006.
11	Mukilteo Garage	Repair shop and former gasoline service station located about 300 feet south of the project area	The automotive repair service operated from at least the late 1940s through the early 1970s. Two fuel dispensers were observed in front of the garage in December 2002 but were gone by May 2011.
12	Mukilteo Water District	Office building located about 1,250 feet south of the project area	The site had a gasoline underground storage tank that has been removed. No release has been reported for the site.
13	Mukilteo Tank Farm	Property occupies much of project area	Previously remediated site (see Table 4.8-3).
14	WSDOT	Part of property lies within the project area; WSDOT leases remainder to the Port of Everett for the Mount Baker Terminal facility	Asbestos and PCBs.

Site No.: Site number on Figure 4.8-2

<sup>1</sup> No Further Action is the determination used by Ecology to signify that a site cleanup achieved all site-specific cleanup standards.

**Table 4.8-3. Mukilteo Tank Farm Hazardous Materials Summary**

<b>Year</b>	<b>Property Owner/ Operator</b>	<b>Event/Activity</b>	<b>Documented Releases or Past Uses of Hazardous Materials</b>
1903	Crown Lumber Company	Lumber mill constructed.	Fuel oil, lubricating oil, coal storage
1930	Crown Lumber Company	Lumber mill closed.	
1938	Unknown	Mill destroyed by fire.	
Early 1940s	U.S. Army	Mukilteo Explosives Loading Terminal established, including two piers.	Vehicle maintenance (gasoline, diesel, lubricating oils); coal-fired power plant
1951	U.S. Air Force	Property acquired and converted to bulk fuel storage and transfer terminal, in association with McChord Air Force Base in Tacoma; fuel delivered to facility by barge, stored in 10 large aboveground tanks, and distributed by barge, rail car, and tanker truck.	Aviation gasoline, jet propellant
Mid-1960s	U.S. Air Force	Demolished trestle pier (east portion of property) used during World War II for loading ammunition onto ships; small pier added adjacent to the administration building (later the NOAA Mukilteo Research Station building).	
1973	Defense Logistics Agency (DLA)	Operation transferred; facility eventually designated as Defense Fuel Support Point (DFSP) Mukilteo. By the late 1970s, the pier was no longer used for loading fuel.	
1979	DLA	Fuel-contaminated soil discovered within bulk fuel storage tank containment structures.	
1982	DLA	First fuel oil recovery well installed north of and between Tanks 2 and 3.	
1982	DLA	Soil and groundwater in northeast portion of property found to be contaminated.	Chloroform; lead; methylene chloride; tetrahydrofuran; total petroleum hydrocarbons (TPHs), including benzene, toluene, ethylbenzene; jet propellant
1983-1984	DLA	Floating petroleum product observed on groundwater north of Tank 10 and in another recovery well.	Aviation gasoline product
1986-1987	DLA	Damaged section of underground pipeline north of Tank 9 led to estimated loss of 6,700 gallons of jet propellant to the ground, fuel seeps on the beach, and a sheen on Possession Sound.	Jet propellant
1986-1987	DLA	U.S. Navy divers recovered World War II-era ammunition shells from sediments beneath the Tank Farm Pier.	Ammunition shells
1989	DLA	Fuel storage and transfer operations ceased on the property.	
1990	DLA	Washington State Attorney General and DLA entered into a Remedial Action Order requiring DLA to complete a Remedial Investigation/Feasibility Study (RI/FS) for clean-up of the Mukilteo Tank Farm.	
1991	DLA	At least six underground and aboveground fuel, heating oil, waste fuel, and waste oil tanks were removed, and approximately 3,000 gallons of floating petroleum product were recovered.	TPHs, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), PCBs, and heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, and zinc) detected in soils during tank removal
1991-1994	DLA	Preliminary site investigation and remedial investigation performed at the site.	Jet propellant and aviation gasoline product floating on groundwater; contamination of soil, groundwater, surface water, and sediments by

**Table 4.8-3. Mukilteo Tank Farm Hazardous Materials Summary**

Year	Property Owner/ Operator	Event/Activity	Documented Releases or Past Uses of Hazardous Materials
			previously documented chemicals
1993- 1994	DLA	U.S. Navy underwater ordnance survey conducted in areas surrounding the Tank Farm Pier and the trestle pier; no ordnance were found.	
1994	Defense Fuel Supply Center (DFSC)	Ecology issues Enforcement Order to DFSC to address the documented releases of hazardous substances. The order replaced the previous remedial action order from 1990.	
1995- 1997	DFSC	Ecology approved site-specific cleanup standards using Washington State MTCA Method B practices in effect at the time. DFSC initiated collection and treatment of contamination by installation of remedial systems, including fuel product recovery, oil/water separation, soil vapor extraction, and air sparging.	
1997- 2002	DFSC (in 1998, renamed Defense Energy Support Center [DESC])	Remediation systems installed and operated to remove free product, product vapors, and contaminated groundwater. Remediation systems shut down in November 2000 on the east end of the property and in November 2002 on the west end of the property after performance monitoring indicated that contaminants were not detected or were found at concentrations below the cleanup levels negotiated with Ecology for the property.	
2006	DESC	Ecology issued written notification to DESC that the provisions of the Enforcement Order of 1994 had been satisfied, and no future remediation action was required.	
2006- 2007	DESC	WSDOT's archaeological trenching and borings found contaminants of concern in excess of the site's approved cleanup levels in soils in the west and central portions of the property, at depths of 9 to 12 feet below ground surface (see Figure 4.8-2), and petroleum hydrocarbons in excess of MTCA Method A cleanup levels, at depths of 8 to 12 feet below ground surface.	Benzene, toluene, ethylbenzene, and xylenes (BTEX), cPAHs, and gasoline-, diesel- and lube oil-range petroleum hydrocarbons
2010	U.S. Air Force	Development of an Environmental Baseline Survey assessing conditions on the site and updating information on current status of underground and aboveground storage tanks and other buildings.	
2012	U.S. Air Force	WSDOT sediment sampling in support of the EIS review and to address public and agency comments about contamination showed limited levels of contamination for an array of potential contaminants, but encountered contaminants of concern in excess of Dredged Material Management Program (DMMP) Screening Levels and SMS Sediment Quality Levels in the upper 8 feet of sediment around the pier perimeter. Contaminants of concern were also encountered from 8 to 12 feet below the mudline near the northeast corner of the former fuel pier.	Chlordanes, and polycyclic aromatic hydrocarbons (PAHs)

Fuel was delivered to the property by barge and was distributed by barge, railcar, and tanker trucks. Barge and railcar deliveries were transferred to and from 10 aboveground bulk fuel storage tanks; tanker truck deliveries were transferred at two truck-loading racks. In 1973, the U.S. Air Force transferred the Mukilteo Tank Farm land and facility to the Defense Logistics Agency (DLA), which, through the agency now known as the Defense Energy Support Center (DESC), continued operating the facility as a government-owned, contractor-operated fuel storage and transfer terminal. By the late 1970s, the Tank Farm Pier had fallen into disrepair and was no

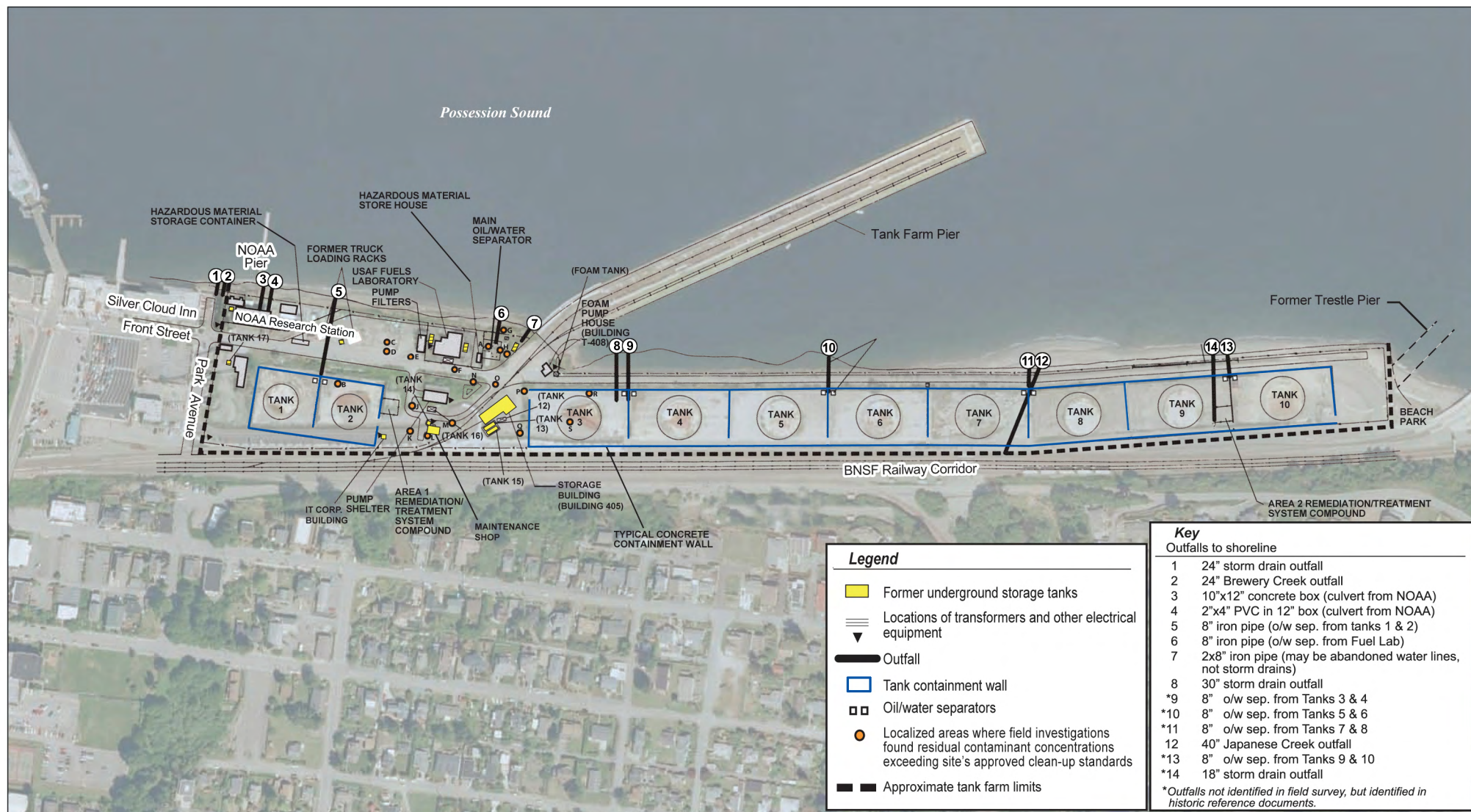
longer used for loading fuel onto railcar tankers. In 1987, the government decided to close the Mukilteo Tank Farm facility and consolidate its mission with a facility in Manchester, Washington. Fuel storage and transfer operations on the property ceased in 1989.

In the late 1970s through the 1980s, hazardous materials were found in the soil, groundwater, surface water, and sediment on the Mukilteo Tank Farm. In 1979, soil contaminated with fuel oil was found in a number of bulk fuel storage tank containments. By 1982, a fuel recovery well had been installed between what was known as the main oil/water separator and the U.S. Air Force Aviation Fuels Laboratory (fuels laboratory), located on the north side of the property. In 1982, soil and groundwater in the northeastern portion of the property was found to be contaminated with chloroform, methylene chloride, tetrahydrofuran, benzene, ethylbenzene, toluene, and total petroleum hydrocarbons. Lead was also found in the groundwater. Several unknown compounds were also encountered. In 1983, 1984, 1986, and 1987, floating contaminants were found in the groundwater in several locations. The suspected sources were leaks from underground storage tanks and damaged underground distribution pipelines, including some that led to seeps to the beach and were visually observed as a sheen on Possession Sound.

In 1990 and 1994, the Washington State Office of the Attorney General, DLA, and Ecology developed remedial action agreements and enforcement orders for the Mukilteo Tank Farm. The DLA installed remedial treatment systems and operated them through 2002, and continued compliance monitoring through 2006. In 2006, Ecology issued written notification to DLA's DESC, stating that the provisions of Enforcement Order No. DE 93TC-N268 had been satisfied, that no further monitoring was required, and that remaining monitoring wells could be abandoned (Brian Sato, Ecology; dated May 22, 2006). No environmental covenant or deed restriction has since been entered against the property, and the property was given a site cleanup status of "Removal from Hazardous Sites List Completed" in Ecology's 2008 *Sediment Cleanup Status Report*.

Although the U.S. Air Force satisfied the terms of Ecology's order, and Ecology determined no further action was needed, WSDOT's archaeological field work for the Mukilteo project encountered areas with soil contamination on the Mukilteo Tank Farm in 2006 and 2007. Soil contamination was identified by sampling and analysis, photo-ionization detector measurements, and visual/odor observations.

Indications of contaminated soil were observed throughout the west and west-central portions of the property as shown in Figure 4.8-3. Site-specific cleanup levels were used to screen the analytical results from the 2006/2007 archaeological investigations for the analytes for which site-specific cleanup levels were identified (some metals, polycyclic aromatic hydrocarbons, and volatile organic compounds). The analytes for which site-specific cleanup levels were promulgated are discussed in detail in the *Hazardous Materials Discipline Report*. MTCA Method A cleanup levels were used to screen the analytical data results for the analytes for which site-specific cleanup levels were not promulgated (including petroleum hydrocarbons). Petroleum hydrocarbons (gasoline-, diesel-, and lube oil-range) were encountered at concentrations in excess of MTCA Method A cleanup levels for industrial and unrestricted land use in soil samples collected in these areas from 8 to 12 feet below ground surface (bgs).



Sources: Herrera Environmental Consultants, Inc. for Jacobs Civil Inc. and Washington State Ferries. December 2003. Hazardous Materials Site Assessment, Former Defense Fuel Support Point Mukilteo Property, Mukilteo, Washington Figure 3.

Figure 4.8-3. Tank Farm Property Features

Polycyclic aromatic hydrocarbons, volatile organic compounds, and metals were detected at concentrations greater than the site-specific cleanup levels and/or MTCA Method A cleanup levels for unrestricted land use in soil samples collected in these areas from 8 to 12 feet bgs. Archaeological borings elsewhere on the site revealed localized residual contamination at lower levels.

The depth of affected soil coincides with the groundwater level “smear zone” at the site. The groundwater smear zone is the tidally influenced groundwater fluctuation range, which is from approximately 8 feet to 12 feet bgs at the property. There is the potential that affected soil may remain at these depths throughout the site. Remnant contamination also could affect groundwater. Additional sampling of soil and groundwater is needed to characterize the existing conditions at the site. The *Hazardous Materials Discipline Report* provides more information about measures to address remnant contamination as identified by the U.S. Air Force in its *Final Environmental Assessment* and resulting *Finding of No Significant Impact* in 2012. The U.S. Air Force has stated that it will retain environmental and public safety responsibilities associated with “the discovery of significant contaminants attributable to legacy DOD operations on the property” (U.S. Air Force 2012).

Slag material is suspected to be present in the riprap material armoring the shoreline. Material that appears to be slag was observed in the riprap during a 2012 site visit. The source of this material is unknown but slag produced at the former Everett Asarco copper smelter was historically used in riprap armoring throughout the Puget Sound. Heavy metals associated with slag from copper smelters may be present in the soil beneath the riprap at the site.

In March and April 2012, sediment samples were collected in six locations around the perimeter of the pier and in three locations beneath the pier. The samples were analyzed for Dredged Material Management Program (DMMP) and SMS contaminants of concern.

Pesticides were detected in perimeter sediment samples collected from the surface to 8 feet below the mudline at concentrations greater than DMMP Screening Levels and/or SMS Sediment Quality Standards. Polycyclic aromatic hydrocarbons were detected in one discrete sample collected near the northeast corner of the pier from 8 to 12 feet below the mudline. No exceedances were encountered in the surface to 4-foot-interval samples collected from beneath the pier. Dioxin concentrations measured in surface sediments around the pier ranged from 4.09 parts per trillion (ppt) toxic equivalents (TEQs) to 1.9 ppt TEQ. Open-water disposal is allowed as long as the volume-weighted average concentration of dioxins in material from the entire dredging project does not exceed the Disposal Site Management Objective of 4 ppt TEQ.

Deeper sediment (greater than 4 feet below the mudline) beneath the Tank Farm Pier may be affected by the 3,900 creosote-treated piles. Deeper sediments under the pier could also be contaminated with petroleum hydrocarbons from the pier’s nearly 30-year use as a bulk fuel storage and transfer facility.

### **4.8.3 Long-Term Environmental Impacts**

This section discusses potential impacts that could occur during project operation, including effects associated with the permanent facilities that would be in place and effects from ongoing operations of the multimodal facility. Potential adverse operational

impacts include hazardous material leaks and spills by the traveling public, leaks due to the operation and maintenance of the terminal, dispersal of contaminated sediment, and groundwater contamination due to stormwater infiltrating through landscape features and into contaminated soils, which could cause migration of hazardous materials. Beneficial operational impacts include reduction of exposure to hazardous materials because of project-related improvements or longer-term site management measures.

All project alternatives would use hazardous materials similarly due to the types and intensities of activities that occur at ferry terminals. There is the potential for leaks or spills from vehicles in holding areas, area roadways, transit centers, or other terminal operation and maintenance activities. However, as described in more detail in *Section 4.11 Water Resources*, the Build alternatives would develop stormwater retention and treatment facilities to meet current standards, which would reduce the effects of potential spills and their transport to receiving waters.

Both the Preferred Alternative and Elliot Point 1 Alternative include stormwater facilities and landscaping in potentially contaminated areas. The Elliot Point 1 Alternative also includes daylighting of Japanese Creek, with grading changes that could affect the flow of groundwater in the area. Infiltrating water or changing groundwater flow could spread existing contamination if such contamination exists.

All alternatives would result in long-term benefits by removing the existing terminal structures, including in-water and landside structures, some of which contain hazardous materials. The likely contaminants in the existing structures are described in more detail under *Section 4.8.4 Construction Impacts* below. All Build alternatives would create additional long-term benefits by removing existing contaminants in soil or groundwater as necessary during construction. Over time, if left in place, these materials could migrate or become exposed due to groundwater movement.

The most environmental benefits would be expected from the Preferred and Elliot Point 1 alternatives, which would remediate hazardous materials associated with the Mukilteo Tank Farm and the pier as needed.

#### 4.8.4 Construction Impacts

The potential short-term impacts during project construction include impacts to the natural environment or to people if the project encounters or causes the spread of hazardous materials. They also include the potential for construction activities to cause a new release of hazardous materials. Table 4.8-4 summarizes by alternative the common effects anticipated.

**Table 4.8-4. Construction Activities Involving Areas with Potential Hazardous Materials**

Construction Activities Potentially Affected by Hazardous Materials	Alternative			
	No-Build	Preferred Alternative	Existing Site Improvements	Elliot Point 1
Acquire property with potential hazardous materials releases	X	X	X	X
Renovate, remove, or excavate structures and equipment that could contain asbestos, lead-based paint, PCBs, and mercury	X	X	X	X
Remove storage tanks and/or associated contaminated soil		X	X	X

**Table 4.8-4. Construction Activities Involving Areas with Potential Hazardous Materials**

Construction Activities Potentially Affected by Hazardous Materials	Alternative			
	No-Build	Preferred Alternative	Existing Site Improvements	Elliot Point 1
Decommission underground oil/water separators, bulk fuel distribution facilities, remediation wells, and all associated piping		X		X
Remove creosote-treated timber and piles from structures being renovated or removed	X	X	X	X
Disturb, dredge, or excavate sediment and soil that has been in contact with creosote-treated timber or piles	X	X	X	X
Grade or excavate potentially contaminated soil	X	X	X	X
Dewater excavations or pits in the vicinity of potentially contaminated groundwater		X	X	X
Construct stormwater facilities in areas with potential contamination		X	X	X

### No-Build Alternative

The No-Build Alternative would require the continued leasing or the acquisition of all or part of Site 6—a portion of the area currently used for vehicle holding. The existing facility has areas where hazardous materials may be present.

The No-Build Alternative would remove the creosote-treated timber piles used for the existing terminal, which could disturb nearby sediments. It would also replace structures or equipment that could contain asbestos, lead-based paint, PCBs, or mercury.

Upland grading, excavation, or dewatering could encounter contaminated soil or groundwater because some migration from a previously contaminated site under the vehicle holding area may have migrated toward the No-Build Alternative's area of construction.

### Preferred Alternative

For this alternative, WSDOT would acquire a property interest in three sites with previous contamination. All structures, equipment, and other existing surface features will be removed from the Mukilteo Tank Farm site (including the pier). Some of the existing features and equipment to be removed from the Mukilteo Tank Farm may contain hazardous materials. A U.S. Air Force survey of current and past fuel or other hazardous material storage tanks found that nearly all of them have been removed or drained of hazardous materials. Tanks with product remaining would be a source of contamination if they were ruptured during construction. Construction for this alternative would occur on the west and west-central portions of the Mukilteo Tank Farm where contaminated soils and groundwater were encountered in 2006 and 2007.

Underground oil/water separators, bulk fuel distribution facilities, remediation wells, and associated piping could still exist within the Preferred Alternative footprint. Such

structures could contain residual petroleum products and other hazardous materials that could be spread during project construction.

The removal of the existing ferry structures and the Tank Farm Pier, as well as dredging the 500-foot-wide navigation channel, would disturb sediment and soil that have been in contact with creosote-treated timber or piles. Creosote contains polycyclic aromatic hydrocarbons, which often leach into the surrounding sediments and could be released during pile removal when those sediments are disturbed. If contamination is present in the sediments, exposure to currents and wave action could spread contamination over a larger area.

A dredge material characterization study would be completed to evaluate the suitability of the material in the proposed dredge prism for open-water disposal. The Dredged Material Management Office (DMMO) will evaluate the analytical results from the samples that will be collected for the study and make a determination regarding the suitability of the material for open-water disposal.

During and after pier removal and dredging for the Preferred Alternative, exposed sediments could be vulnerable to minor levels of disturbance or dispersal by wave action and ferry propeller scour. Sampling information indicates that contaminants of concern could be present in surfaces that would be exposed by the Preferred Alternative. WSDOT conducted additional analysis (Coast & Harbor 2013) of the 2012 sediment sampling results. The study indicates that propeller scour will affect a small and localized scour area with a maximum sediment depth of 1.4 feet for the Preferred Alternative (with no detectable shoreline impact). The maximum volume of material that would be mobilized during a 25-year storm event is approximately 1,050 cubic yards, resulting in an average of 0.08 inch of surface sediment material settling in the basin on the east side of the existing pier. The majority of this material would be deposited within 1,800 feet of the pier. These levels of dispersion would be unlikely to result in contaminants exceeding Washington State's SMS in these areas.

Much of the construction of this alternative is designed to avoid excavation within the tank farm site, particularly in the western portion where archaeological resources may also be present. The alternative proposes placing fill and pavement over large portions of the site, which would reduce the potential for construction activities to encounter or cause the spread of hazardous materials. Excavation or stormwater infiltration features with soil or groundwater sampling and testing would occur on less than 20 percent of the project site. However, the project could encounter hazardous materials when excavating for utilities, stormwater systems, and structural foundations or grading. Dewatering could alter groundwater flow in the excavation dewatering area, which could result in hazardous materials migration.

The potential presence of remnant contamination would require additional plans, procedures, and permitting approvals to construct the Preferred Alternative. This would include plans for the handling or disposal of hazardous materials in accordance with applicable regulations. However, with appropriate plans in place, it is unlikely that the alternative's construction activities would result in further impacts on people or the environment; moreover, the removal or containment of contamination would improve environmental conditions.

## **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative would result in impacts related to removal of the existing terminal structures, creosote-treated timber and piles, and sediment near creosote-treated timber and piles. These impacts would also apply to the Port of Everett fishing pier and day moorage.

This alternative would require acquisition of all or part of six additional sites located in the central waterfront area of Mukilteo and associated demolition and removal of structures or equipment that could contain asbestos, lead-based paint, PCBs, or mercury. The alternative includes the construction of a transit center on a property that has been previously identified with a hazardous material release. It also includes acquiring property that was once used as a gasoline service station. These sites may require additional plans, procedures, and approvals for their construction, including the handling or disposal of hazardous materials, but it is unlikely that the alternative's grading, excavation, or dewatering activities would result in an increased spread of contaminated soil or groundwater.

## **Elliot Point 1 Alternative**

The Elliot Point 1 Alternative would have a similar potential to encounter hazardous materials during project construction as the Preferred Alternative. There may be some localized differences during construction due to the different footprints. This alternative has a larger footprint than the Preferred Alternative, which increases the extent of construction. It has a longer extension of First Street and includes the daylighting of Japanese Creek.

After pier removal and dredging for Elliot Point 1, exposed sediments could be vulnerable to minor levels of disturbance or dispersal by wave action and ferry propeller scour, with potential effects that are similar to those described for the Preferred Alternative. The scour effects would extend several feet deeper into the sediments than for the Preferred Alternative, but with no serious impacts (Coast & Harbor 2013).

As with the Preferred Alternative, much of the construction of this alternative is designed to avoid excavation within the tank farm site, particularly in the western portion where archaeological resources may be present. The alternative's proposed fill and paved areas would also reduce the potential for construction activities to encounter or cause the spread of hazardous materials. However, the Elliot Point 1 Alternative could encounter hazardous materials during excavation for utilities, stormwater systems, structural foundations, or grading activities, and when daylighting Japanese Creek. As with the Preferred Alternative, dewatering activities associated with construction could locally alter groundwater flow, which could result in hazardous materials migration.

## **4.8.5 Indirect and Secondary Impacts**

No indirect or secondary impacts are anticipated for any of the project alternatives.

#### **4.8.6 Cumulative Impacts**

This project and future projects in the area would support increased environmental protection and appropriate cleanup and mitigation of any hazardous materials in accordance with existing regulations and future regulations, which are likely to be more stringent. This project would not result in an accumulation of hazardous materials. The Preferred Alternative and the Elliot Point 1 Alternative would remove contamination encountered on the Mukilteo Tank Farm, whereas the No-Build and Existing Site Improvements alternatives would not. Therefore, if contamination is present at the Mukilteo Tank Farm, it could remain there longer under the No-Build and Existing Site Improvements alternatives.

#### **4.8.7 Mitigation Measures**

##### ***Preferred Alternative***

Mitigation measures for all project activities would be defined through a project-specific Hazardous Materials Management Plan developed in consultation with Ecology. WSDOT has a spill plan that the Ferries Division would use to respond to spills or leaks that may occur during project operation.

Long-term impacts for the Preferred Alternative were identified due to the potential for migration of potentially contaminated sediments beneath the Tank Farm Pier, and for the possible migration of contamination due to infiltrating stormwater in areas with potentially contaminated soils or groundwater.

The Hazardous Materials Management Plan would include measures for dredging and disposal of contaminated sediments, and capping, armoring, or otherwise minimizing the potential for migration due to wave action, currents, or propeller scour. Many of these activities would be defined through the DMMP process and other state and federal water quality and aquatic lands permitting and management programs; the project would comply with all terms and conditions defined through those required regulatory processes. Mitigation measures to manage the potential for contaminated sediment migration would be addressed as part of these required regulatory approvals, which are further discussed under construction mitigation. Potential measures may include sediment capping, near shore armoring, and clean sand and gravel in areas where piles are removed.

Stormwater facilities would be developed in accordance with the applicable permit requirements identified for water resources. If WSDOT and permitting authorities conclude that infiltrating stormwater facilities are appropriate for the Preferred Alternative, mitigation would include placing infiltration stormwater facilities only in areas where there is no contamination. Alternatively, if infiltration is necessary in contaminated areas, WSDOT would clean up the soil beneath and downgradient of the facilities to prevent the spread of contamination into Possession Sound.

##### ***No-Build and Existing Site Improvements Alternatives***

Some contaminated sediments could still be encountered or exposed during implementation of the No-Build and Existing Site Improvements alternatives but sediment migration would be less likely with these alternatives. The mitigation

measures would be similar to those discussed for the Preferred Alternatives if contaminated sediment is encountered or exposed for these alternatives.

### ***Elliot Point 1 Alternative***

The long-term impacts and mitigation measures for the Elliot Point 1 Alternative are similar to those identified for the Preferred Alternative. The identified long-term impacts include the potential for migration of potentially contaminated sediments beneath the Tank Farm Pier, and for the possible migration of contamination due to infiltrating stormwater in areas with potentially contaminated soils or groundwater.

The mitigation measures discussed for the Preferred Alternative would also be implemented for the Elliot Point 1 Alternative.

## **Mitigation for Construction Impacts**

### ***Preferred Alternative***

Mitigation measures for all project activities will be defined through a project-specific Hazardous Materials Management Plan developed in consultation with Ecology. The site-specific Hazardous Materials Management Plan would include the following elements and procedures:

- State requirements for appropriately trained hazardous waste operations and response personnel
- A site-specific health and safety component regarding contaminated material exposure and personal protective equipment
- Defined site-specific measures to minimize exposure to contaminants through both airborne and direct contact routes
- Plan for appropriate space to stockpile graded and excavated soil that shows evidence of being contaminated or that is to be disposed of off site
- Require characterization of the bedding material beneath the bottom pad of each steel tank bottom located on the Mukilteo Tank Farm
- Require pre-demolition surveys of any structures to be removed to identify the presence of hazardous materials and to determine appropriate management procedures.
- Require careful removal of the granular asphalt bedding material beneath the bottom pad of each welded steel tank bottom that is removed for project construction
- Require characterization of soil in any areas where project excavation will encounter it, and the definition of management remediation measures if any are identified.
- Require characterization of site soil in any areas identified for stormwater ponds or infiltration

- Prepare a Creosote-Treated Timber Removal and Disposal Plan to address how piles and adhered sediments will be removed, managed, and disposed of in accordance with state laws and regulations. WSDOT would coordinate with EPA, Ecology, DNR, and others to develop and employ BMPs for creosote timber removal. WSDOT would also prohibit the reuse of these timbers.
- Remove, manage, and dispose of residual petroleum products and petroleum-contaminated soil that is encountered would be done in accordance with applicable regulations. Any wells requiring abandonment would need to be abandoned by a licensed well driller in accordance with state regulations.
- Decommission any remaining storage tanks onsite according to tank decommissioning and site assessment regulations. Any contaminated soil associated with the removed tanks would be tested in accordance with regulatory or permit specifications.
- Develop a Groundwater Management Plan to address any contaminated groundwater that may be dewatered from areas with potentially contaminated soils during project construction. The plan would require groundwater characterization in locations where excavations would encounter groundwater, where infiltration or stormwater ponds would be located, or where the location is downgradient from any contaminated soil areas
- Develop a Spill Prevention, Control and Countermeasures (SPCC) Plan and a Temporary Erosion and Sediment Control (TESC) Plan. The SPCC Plan would identify and include measures to protect sensitive receptors, describe any pre-existing contamination and contaminant sources, and identify the equipment and work practices that would be used to prevent the release of contamination.

### **Mitigation for Impacts due to Removal of Contaminated Sediment or Dredged Sediment**

WSDOT will manage and dispose of contaminated sediment in accordance with applicable permits and regulations, including permits or plans required by Ecology and DNR. The DMMP Process and related permits such as the Section 401 Water Quality permit would define construction as well as post-construction requirements for the management of hazardous materials that maybe present in sediment. A DMMP-approved dredge material characterization would be completed to identify any contaminants of concern that may be present within the dredge prism. As would be specified in the project permits (including Section 401 Water Quality), BMPs will be implemented during dredging to minimize sediment transport and increased turbidity. Anticipated BMPs include:

- Controlling the speed of the dredging bucket
- Controlling the depth of the dredging bucket “bites”
- Using an enclosed dredging bucket

- Monitoring water quality (turbidity and chemical analyses) during dredging
- Defining periods when dredge activity would be allowed.

Work would be stopped immediately and additional BMP implementation will be evaluated if exceedances of 401 Water Quality criteria are observed during construction period water quality monitoring. Additional BMPs may include (but are not limited to) the use of silt curtains, sheet pile enclosures, removable dams, silt screens, or pneumatic (bubble) curtains.

WSDOT would comply with the results of the DMMP process and permits to evaluate that dredge spoils are clean and eligible for open-water disposal at a site already permitted by the DMMP agencies, or if material is contaminated and required to be disposed at an approved upland facility. The DMMP has jurisdiction over the final decision and permitting for open-water disposal suitability of the dredge material. BMPs and DMMP-approved methodology will be used for open-water disposal of dredge material, if any.

As anticipated in permits and approval conditions, WSDOT would conduct testing to determine if contaminated sediments are present at depths that would be exposed after dredging. If contamination exceeds applicable regulatory criteria, WSDOT would work with permitting agencies to develop protective measures to reduce the potential for erosion and transport of contaminated sediment. The detailed measures and the data requirements necessary to define the measures would be guided by the project's permitting process and associated requirements.

### **Mitigation for Indirect or Cumulative Impacts**

No adverse indirect or cumulative impacts were identified because past practices involving hazardous materials are already being addressed by the project; therefore, no additional mitigation is necessary.

## **4.9 Energy and Climate Change**

This section reviews both operational and construction energy use and the potential for climate change effects either as a result of the project or potentially affecting the project.

### **4.9.1 Overview of Analysis and Regulatory Context**

#### **Energy**

SEPA regulations recommend reviews of effects on natural resources, while NEPA regulations more specifically cite the need to consider energy requirements and conservation potential (40 CFR 1502.16). This energy analysis includes a building energy analysis, as required by 49 CFR 622.301, which instructs FTA to consider the energy consumption of buildings that are constructed as part of transit projects receiving federal funding.

According to USDOT guidance, large-scale projects with potentially substantial energy impacts should discuss the major direct and/or indirect energy impacts and conservation potential of each alternative.

## Climate Change

The assessment of the project's potential to increase greenhouse gas emissions and contribute to climate change follows WSDOT's *Guidance for Project-Level Greenhouse Gas and Climate Change Evaluations*. Section 4.7 *Air Quality* provides more detailed discussions of other emissions and pollutants related to air quality and Clean Air Act requirements for the project.

Vehicles emit a variety of gases during their operation; some of these are greenhouse gases. The greenhouse gases associated with transportation are water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). Any process that burns fossil fuel releases CO<sub>2</sub> into the air. CO<sub>2</sub> makes up the majority of the emissions from transportation.

Vehicles are a primary source of greenhouse gas emissions and contribute to climate change primarily through the burning of gasoline and diesel fuels. National estimates show that the transportation sector (including on-road vehicles, construction activities, airplanes, and boats) accounts for almost 30 percent of total domestic CO<sub>2</sub> emissions. However, in Washington State, transportation accounts for nearly half of greenhouse gas emissions because the state relies heavily on hydropower for electricity generation, unlike other states that rely on fossil fuels such as coal, petroleum, and natural gas to generate electricity. The next largest contributors to total greenhouse gas emissions in the state are fossil fuel combustion in the residential, commercial, and industrial sectors at 20 percent; and electricity consumption, also 20 percent. Figure 4.9-1 shows the gross greenhouse gas emissions by sector, nationally and for Washington State. Figure 4.9-2 compares Washington's per capita transportation emissions to the national average and high and low jurisdictions. By this metric, Washington's emissions are just above average.

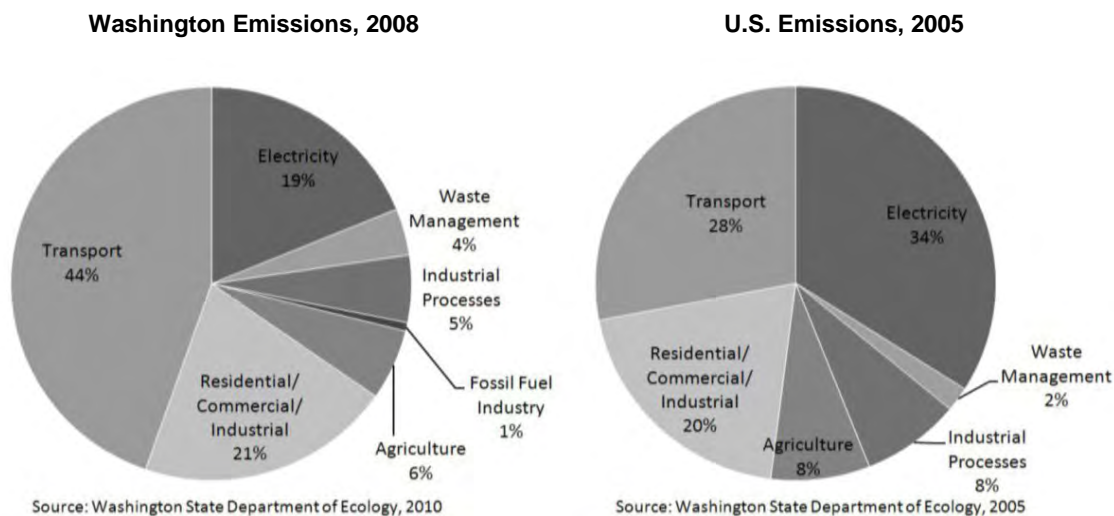


Figure 4.9-1. **Greenhouse Gas Emissions by Sector in Washington State (2008) and the U.S. (2005)**

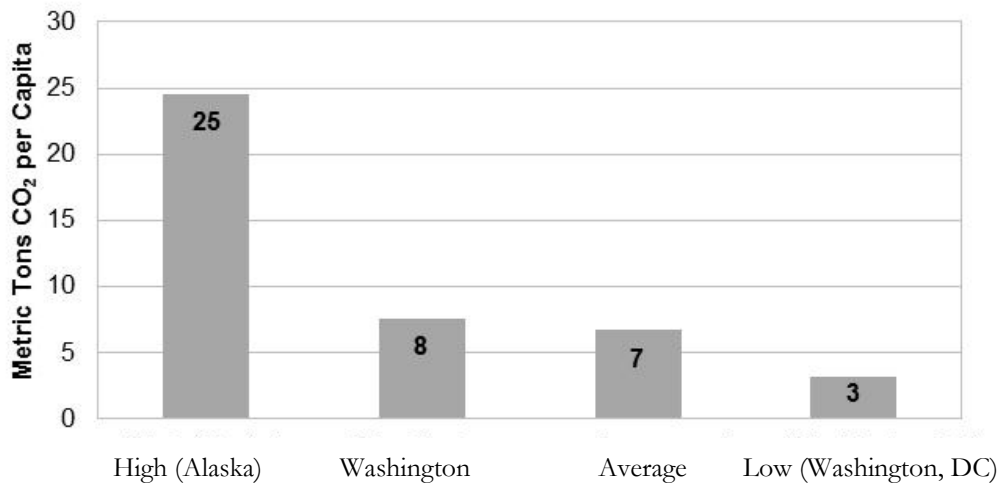


Figure 4.9-2. **Per Capita Transportation Greenhouse Gas Emissions by State (2005)**

### Efforts to Reduce Greenhouse Gas Emissions in Washington State

In 2007, Washington State set the following greenhouse gas reduction goals:

- 1990 greenhouse gas levels by 2020
- 25 percent reduction below 1990 levels by 2035
- 50 percent reductions below 1990 levels by 2050

Also in 2007, a Climate Advisory Team was formed in response to the Governor's Executive Order 07-02 to find ways to reduce greenhouse gas emissions. The final report included 13 broad recommendations, many of which are now being implemented.

In March 2008, the Governor signed Washington's Climate Change Framework/Green-Collar Jobs Act (HB 2815). This law includes, among other elements, statewide per capita VMT reduction goals as part of the state's greenhouse gas emission reduction strategy.

WSDOT is working with regional jurisdictions to develop transportation plans for reducing greenhouse gas emissions. In addition, WSDOT is among the six agencies that lead the development of the state's integrated climate change response strategy, now published, titled *Preparing for a Changing Climate* (Ecology 2012).

Delivering well-planned transportation improvements further contributes to greenhouse gas reduction. The 2005 Transportation Partnership Act is an integrated local, regional, and state effort to ensure that system improvements work in concert with ongoing programs to reduce the miles that vehicles need to travel each year.

### 4.9.2 Affected Environment

The proposed alternatives, adjacent streets, and SR 525 queue lane comprise the study area for evaluating energy and greenhouse gas emissions.

### 4.9.3 Long-Term Environmental Impacts

Table 4.9-1 compares the energy and greenhouse gas effects of all alternatives.

While some alternatives offer the potential for energy and emission reductions, these reductions would be negligible compared to the total emissions emitted by the ferry users at the Mukilteo ferry terminal.

As required by RCW 39.35, WSDOT would design all terminal buildings with occupied space to meet the United States Green Building Council Leadership in Energy and Environmental Design (LEED) silver standard. LEED-certified buildings are more energy efficient than conventional buildings, and incorporate a variety of conservation measures.

### 4.9.4 Construction Impacts

Energy is required for project construction, both on site to operate construction equipment and off site to create and transport the materials used during construction.

Construction energy use was calculated using the CalTrans methodology that correlates project cost information to project energy use by using energy factors developed by CalTrans (CalTrans 1983). These factors take into account the energy used to obtain the raw materials, manufacture and transport the supplies, and construct the facility.

Construction emissions originate primarily from the combustion of fuel used to construct the facility. The greenhouse gas emissions analysis assumed all construction energy will be provided by diesel and used the diesel CO<sub>2</sub> emission factors provided by The Climate Registry's General Reporting Protocol. Nitrous oxide and methane emissions were estimated to be 5 percent of the CO<sub>2</sub> emissions—the approximate proportion of the emissions typical from transportation sources. This approach is also consistent with recent EPA inventories of greenhouse gases from construction sources, which show nitrous oxide at about 3 percent of projected CO<sub>2</sub> emissions per gallon, and methane at about 5 percent (EPA 430-R-12-001).

### Alternatives Comparison

All alternatives would require energy for construction and produce greenhouse gas emissions during the construction process, including the No-Build Alternative, which includes maintenance and preservation projects to maintain the functionality of the existing structures. Estimated construction energy and greenhouse gas effects for all alternatives are listed in Table 4.9-2 and construction greenhouse gas emissions are compared in Figure 4.9-3.

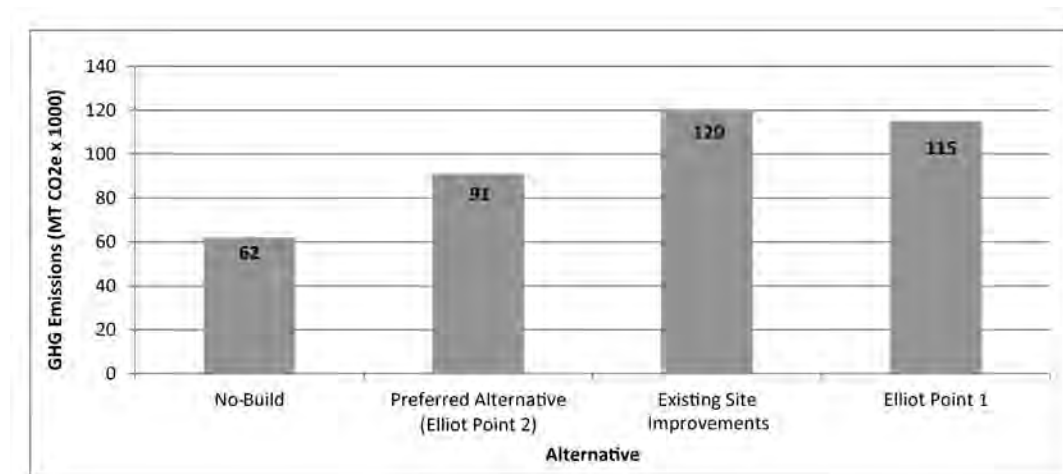
**Table 4.9-1. Operational Impacts Comparison**

	No-Build	Preferred Alternative	Existing Site Improvements	Elliot Point 1
Local traffic volumes	The project does not affect ferry holding area vehicle capacity or vessel capacity; therefore, no change in traffic volumes is expected between project alternatives.			
Ferry queue (outside ferry terminal)	A ferry queue would continue to form on the shoulder of SR 525—no change in emissions or energy use.	Energy and greenhouse gas emissions would be similar to those today, and less than the No-Build Alternative.	A ferry queue would continue to form on the shoulder of SR 525—no change in emissions or energy use.	The ferry queue would be less likely to extend onto SR 525, helping to reduce conflicts and decrease energy use and greenhouse gas emissions.
Toll booths	Similar to existing conditions, the No-Build Alternative would include three toll booths—no change in emissions or energy use.	All Build alternatives include four toll booths. If all four booths are staffed and operating, the ferry queue may be processed more quickly, thereby removing traffic from the street and allowing drivers to turn off their vehicles—possible slight reduction in energy use and greenhouse gas emissions.		
Front Street conflicts	Similar to existing conditions, as ferry vessels would load and unload; traffic on Front Street would still need to stop to allow ferry traffic to cross the intersection. Gaps would continue to be inserted during the unloading and loading processes to allow cross traffic to proceed. Current conditions would continue—no change in emissions or energy use.	The conflict with traffic on Front Street would be removed. Eliminating cross traffic waiting for ferry traffic and ferry traffic waiting for cross traffic would slightly reduce energy requirements and greenhouse gas emissions because vehicles would not sit idling while waiting for cross traffic to clear.	Similar to existing conditions, as ferry vessels would load and unload; traffic on Front Street would still need to stop to allow ferry traffic to cross the intersection. Gaps would continue to be inserted during the unloading and loading processes to allow cross traffic to proceed. Current conditions would continue—no change in emissions or energy use.	The conflict with traffic on Front Street would be removed. Eliminating cross traffic waiting for ferry traffic and ferry traffic waiting for cross traffic would slightly reduce energy requirements and greenhouse gas emissions because vehicles would not sit idling while waiting for cross traffic to clear.
Terminal bus loading areas	Current conditions would continue—no change in emissions or energy use.	Six bus bays are included in the Build alternatives. This should allow buses to remain in place during layovers, slightly reducing energy requirements and greenhouse gas emissions.		
Passenger loading	Similar to existing conditions, vehicles would wait while walk-on passengers load and unload from the ferry. Some vehicles would be idle during this wait. The current loading and unloading process would continue—no change in emissions or energy use.	Overhead passenger loading would allow passengers to load and unload simultaneously with vehicles—possible reduction in energy use and greenhouse gas emissions because vehicles would not idle while waiting for passenger loading and unloading.		
Terminal buildings	All alternatives would replace the current passenger and terminal supervisor's buildings. The project team will determine the specific methods to achieve LEED silver certification, as required by state law, during final project design.			

**Table 4.9-2. Construction Impacts Comparison**

	No-Build	Preferred Alternative	Existing Site Improvements	Elliot Point 1
Energy (MBtu)	807,000	1,203,000	1,564,000	1,516,000
Greenhouse Gas Emissions (MT CO <sub>2</sub> e)	62,000	91,000	120,000	115,000

Note: Total energy is expressed in million Btus, and greenhouse gases in metric tons of carbon dioxide equivalents.

**Figure 4.9-3. Construction Greenhouse Gas Emissions**

## 4.9.5 Indirect and Secondary Impacts

### Energy

Energy consumption can cause indirect impacts if construction or operation of the project causes measurable impacts on other sectors of the economy, such as utilities, or affects the ability of Washington State to meet the energy demands for this project, requiring expansion of existing energy sources.

Project operations would not cause a measurable change in energy use patterns or quantities in other sectors of the economy for any alternative. In addition, vehicles using the facility would become more efficient over the coming years as older, less efficient vehicles are replaced with newer vehicles meeting increased fuel economy requirements. Increased transit connectivity from the Build alternatives can also be expected to shift some passenger vehicle use to more efficient transit modes.

Likewise, energy requirements for project construction would not affect area energy supplies.

### Greenhouse Gas Emissions

Greenhouse gas emissions are an indirect consequence of transportation energy consumption using petroleum fuels. Because the project alternatives would not modify operational energy use patterns, there would not be any indirect change in emission patterns from any of the project alternatives associated with operational energy use. However, if the increased transit connectivity provided by the project

produces a shift to more efficient transit modes, greenhouse gas emissions could be reduced.

#### **4.9.6 Cumulative Impacts**

The regional-scale analysis methods used for energy use and greenhouse gas emissions is largely a cumulative impact assessment because it already considers past and future trends, conditions, activities, and projects in the region. The long-range transportation forecasts that form the basis for the energy and greenhouse gas conditions predicted for the project already incorporate other transportation projects and regional travel growth through 2040. Other localized projects could also affect conditions in some locations. The other present and reasonably foreseeable activities in the area include:

- Mukilteo Tank Farm transfer from the U.S. Air Force to Port of Everett ownership
- Sound Transit Mukilteo Station Phase II program
- NOAA Fisheries Mukilteo Research Station expansion
- Port of Everett access road to Mount Baker Terminal
- Japanese Creek restoration

For any of the alternatives, construction and operation of the proposed project, along with these present and reasonably foreseeable future projects, would make up a negligible part of regional energy consumption or statewide greenhouse gas emissions. In general, the cumulative impacts would not differ from the conditions predicted for the project alternatives, or differ among the alternatives.

#### **4.9.7 Energy and Greenhouse Gas Reduction Measures**

##### **Operational Energy Reduction Measures**

WSDOT and its transportation partners are working to reduce energy consumption and greenhouse gas emissions from the transportation sector throughout the state, including the ferry system. For any of the Build alternatives, examples of these activities would be providing an alternative to driving alone (such as carpooling, vanpooling, and transit); developing a transportation facility that encourages transit, HOV users, bicycle and pedestrian modes; and supporting land use planning and development that encourage such travel modes (such as concentrating growth within urban growth areas). Improving efficiency in loading and unloading ferry vessels, and shorter queues, would also reduce idling time and therefore energy consumption and greenhouse gas emissions. WSDOT also has switched its fleet to low-sulfur diesel fuel and biodiesel to reduce emissions.

The largest reduction in transportation energy use and greenhouse gas emissions would come from vehicle and fuel improvements. Current corporate average fuel economy (CAFE) standards require the average efficiency of new cars and light trucks sold in 2016 to be 34.1 miles per gallon. In August 2012, the federal government set the goal of 54.5 miles per gallon for new passenger cars and trucks starting in 2025. The National Highway Traffic Safety Administration (NHTSA)

and EPA are now working on additional light-duty vehicle standards for the years 2017 to 2025. The agencies are also establishing the first medium- and heavy-duty vehicle efficiency standards (NHTSA 2010), which are expected to improve new truck efficiency by up to 25 percent between 2014 and 2018.

The project will determine the specific methods to achieve LEED silver certification, as required by state law, during final project design. LEED-certified buildings are more energy efficient than conventional buildings. Building operations from new LEED-certified terminal buildings would use less energy on a per square foot basis than the current structures.

### **Construction Energy Reduction Measures**

Construction practices that minimize roadway congestion and encourage efficient energy use would be implemented. Measures that reduce energy use and air quality impacts (see *Section 4.7 Air Quality*) would also reduce greenhouse gas emissions. As in the mitigation for air quality impacts, WSDOT would require a construction management plan that would include:

- Limiting equipment idling
- Encouraging carpooling of construction workers
- Locating staging areas near work sites
- Scheduling the delivery of materials during off-peak hours to allow trucks to travel to the site with less congestion and at fuel-efficient speeds

### **Indirect and Secondary Impacts**

The increased efficiency of the transportation system, due to more people using transit to reach the ferry, would reduce energy use. WSDOT is also implementing a more efficient vessel fleet, which will reduce energy use. Direct energy use and greenhouse gas emissions would also reduce indirect impacts.

### **Cumulative Impacts**

Measures taken to address direct energy use and greenhouse gas emissions would also reduce cumulative impacts.

#### **4.9.8 Effects of Changing Climate on the Project**

WSDOT acknowledges that effects of climate change may alter the function, sizing, and operations of its facilities; therefore, in addition to mitigating greenhouse gas emissions, WSDOT must also ensure that its transportation facilities can adapt to the changing climate. To ensure that WSDOT facilities can function as intended for their planned 50- to 100-year lifespan, they must be designed to perform under the variable conditions expected as a result of climate change.

Climate projections for the Pacific Northwest are available from the Climate Impacts Group at the University of Washington (UW Climate Impacts Group 2009). The climate projections indicate that Washington State is likely to experience some or all of the following effects over the next 50 to 100 years:

- Increased temperature leading to more frequent extreme heat events, worsened air quality, and glacial melting
- Sea-level rise, coastal erosion, and salt water intrusion
- Changes in the volume and timing of precipitation resulting in reduced snow pack, increased erosion, and more frequent and severe flooding
- Ecological effects of a changing climate including the spread of disease, altered plant and animal habitats, and negative impacts on human health and well-being

WSDOT has been working with other state agencies to develop the state's integrated climate response strategy focusing on how state-funded capital projects can incorporate future climate conditions. The strategy, *Preparing for a Changing Climate* (Ecology 2012), looked at the complex interplay between climate variables and communities. As the Mukilteo Multimodal Project continues toward funding, final design, and other implementation steps, WSDOT will continue to incorporate the state's latest guidance.

For example, inundation from rising sea levels and heavy surface flow from storms would challenge the capacity of storm drains, creeks, rivers, and water treatment facilities. Rising sea levels could inundate or disrupt numerous nearshore facilities, including:

- Transportation infrastructure
- Public ports
- Private business and industry
- Drinking water, wastewater, and stormwater facilities
- Agriculture
- Housing

The Mukilteo project team considered the potential impacts of climate change during preliminary design and the potential for changes in the surrounding natural environment. The current projected medium change in Puget Sound sea level is 13 inches by 2100, with a range of 6 inches to 50 inches (Mote et al. 2008). Overall, recent studies appear to be converging on projected increases in the range of 2 to 4 feet.

With help from PSRC, WSDOT developed maps showing a 2- and 4-foot sea-level rise in the project area. WSDOT then evaluated the potential for projected design measures to withstand the projected sea-level rise and increased storm intensity. Compared to the No-Build and Existing Site Improvements alternatives, the Preferred Alternative and Elliot Point 1 Alternative would provide more opportunities to accommodate sea-level rise by using fill to modify terminal elevation, locating access roads in upland areas, and locating facilities outside the 100-year floodplain. Both the No-Build Alternative and Existing Site Improvements Alternative are located within the 100-year Federal Emergency Management Agency (FEMA) floodplain, as are many of the surrounding land uses and connecting streets. This would make it more difficult to use fill to modify the terminal's elevation to be above floodplain elevation.

Other adaptive measures may be needed to address sea-level rise (additional details on floodplains are provided in *Section 4.11 Water Resources*). Other forecasted climate variables such as temperature and precipitation are within the wide range of climate conditions currently experienced in the project area.

## **4.10 Geology**

This section identifies, describes, and evaluates long-term and short-term impacts from geologic hazards (steep slopes, landslides, liquefaction, earthquake prone areas) to the proposed No-Build and Build alternatives. If ignored, geologic hazards could adversely affect the project in terms of construction worker and public safety; availability and/or quality of natural resources; project schedule and costs; and risk for future facility users. Identifying and mitigating geologic hazards could prevent or reduce these impacts. This section also identifies potential impacts on geologic conditions and resources that may result from construction and operation of the project.

### **4.10.1 Overview of Analysis and Regulatory Context**

NEPA and SEPA require the consideration of impacts on the environment, which includes geologic conditions, hazards, and resources. The Washington State GMA mandates that local jurisdictions adopt ordinances that classify, designate, and regulate land use to protect critical areas. Critical areas include geologically hazardous areas. Critical area ordinances protect locally designated critical areas, and may identify areas susceptible to erosion, sliding, earthquake, or other geological events that pose a threat to incompatible development.

### **4.10.2 Affected Environment**

#### **Regional Geology and Seismicity**

This region was shaped by glaciers that carved deep north-south trending channels filled with glacial till and other sandy soils, sediments, and river deposits. This region is also subject to earthquakes (seismic activity) due to the Juan de Fuca Plate diving under the North American Plate at the Cascadia Subduction Zone. This resulted in the northwest-southeast trending Southern Whidbey Island Fault Zone, which is up to 7 miles wide and contains numerous concealed faults. The nearest fault line is approximately one-third of a mile south of the project area (Johnson et al. 2004). The Southern Whidbey Island Fault Zone is capable of producing crustal earthquakes in excess of surface-wave magnitude 7 (Johnson et al. 1996) and the Cascadia Subduction Zone is capable of producing earthquakes up to moment magnitude 9 (Atwater et al. 2005). This suggests that substantial ground motion may occur in the project area.

#### **Site Topography, Landforms, and Beach Composition**

The project site is located in a flat shoreline area along Possession Sound. Its protective seawall rises from sea level to approximately 10 to 15 feet above mean sea level (MSL) along a 1 horizontal:1 vertical (1H:1V) slope. Prior to the seawall, the original landform was a spit that enclosed a lagoon. This lagoon was filled during

waterfront property development as early as the 1900s. Significant cut-and-fill work occurred in the 1950s as part of historical operations of the Mukilteo Tank Farm.

Inland from the project site and parallel to the shoreline is a bluff that rises to a broad upland plateau along a 1.5H:1V slope to an approximate height of 54 feet MSL. The bluff is bisected by Japanese Gulch and Brewery Creek. A culvert at the base of the bluff conveys this stream under the BNSF corridor and the Mukilteo Tank Farm to Possession Sound. Brewery Creek is enclosed within a pipe system as it passes through the downtown waterfront area before reaching Possession Sound. Streams provide a source of sediment to the beach. The bluff's ability to supply sediment to the beach has been greatly reduced by the presence of the BNSF line. These conditions have resulted in sediment-starved beaches consisting of cobble and gravel in a sand matrix. The natural migration of beach sediment along the shoreline is hindered by the Tank Farm Pier. The net shore drift is north and northeast with wave action predominantly from the southwest (City of Mukilteo 2011).

### **Site Geologic Units**

Surface soils in the project area include urban soils with moderate infiltration rates, and gravelly sandy loams derived from the underlying glacial till. Alternating layers of fine and coarse material result in low to moderate infiltration rates, respectively.

Much of the project area is underlain with up to 22 feet of dredge fill, construction debris, and/or local backfill materials. The fill material consists of unconsolidated sand and small to medium gravel with various amounts of organics. Zones of fill material, consisting of wood, brick, scrap metal, and other debris occur near the shoreline and in locations throughout the project area. These zones are unsuitable for construction. Below the fill are beach deposits that are approximately 40 feet thick at the rail lines and more than 90 feet thick offshore. Below the beach deposits are underlying geologic units of the Vashon Till, Transitional Beds, and the Whidbey Formation. Pressure from overlying ice sheets during glacial events resulted in compaction of these units. The Vashon Till is a dense, non-sorted mixture of clay, silt, sand, gravel, cobbles, and boulders. The Transitional Beds consist of glacial and non-glacial deposits of clays, silts, fine sands, and peaty sand and gravels, and can become unstable in steep slope areas resulting in slope failure and landslides. Clay layers in the lower portion of the Whidbey Formation can restrict vertical movement of groundwater, which could lead to an erosion bowl along the bluff fence and result in slope failure.

### **Geologic Hazards**

Geologic hazards are natural geologic processes that can create environmental conditions that endanger human lives and threaten property. Geologic hazards in the project area are discussed below.

#### ***Erosion***

Erosion can adversely affect surface water quality and/or undermine structures. Soil erosion in the project area can occur from wind and/or improper surface water drainage when soils are exposed during construction. Soil erosion is of

concern along bluffs adjacent to the project area due to soil type, slope inclination, and underlying hardpan.

Erosion of in-water sediment can reduce the lateral capacity for foundations of pier structures, wingwalls, and bulkheads. It also can suspend sediments into the water column, diminishing water quality.

### ***Landslides***

Landslides can damage structures and threaten public safety. These hazards result from a combination of slope inclination (>25 percent), soil type, geologic structure, vegetation, human alteration, and occurrence of water. Steep slopes and high landslide hazards have been identified adjacent to the project area (see Figure 4.10-1).

The potential for landslides in the immediate vicinity of project improvements is low; however, the larger project area could be affected by potential landslides from the bluff. Several small shallow landslides were identified along the bluff area during a landslide survey after the heavy storms in 1996 and winter 2010–2011. These events indicate the bluffs are susceptible to landslides, and additional hazard areas that are not mapped may be present along the bluff.

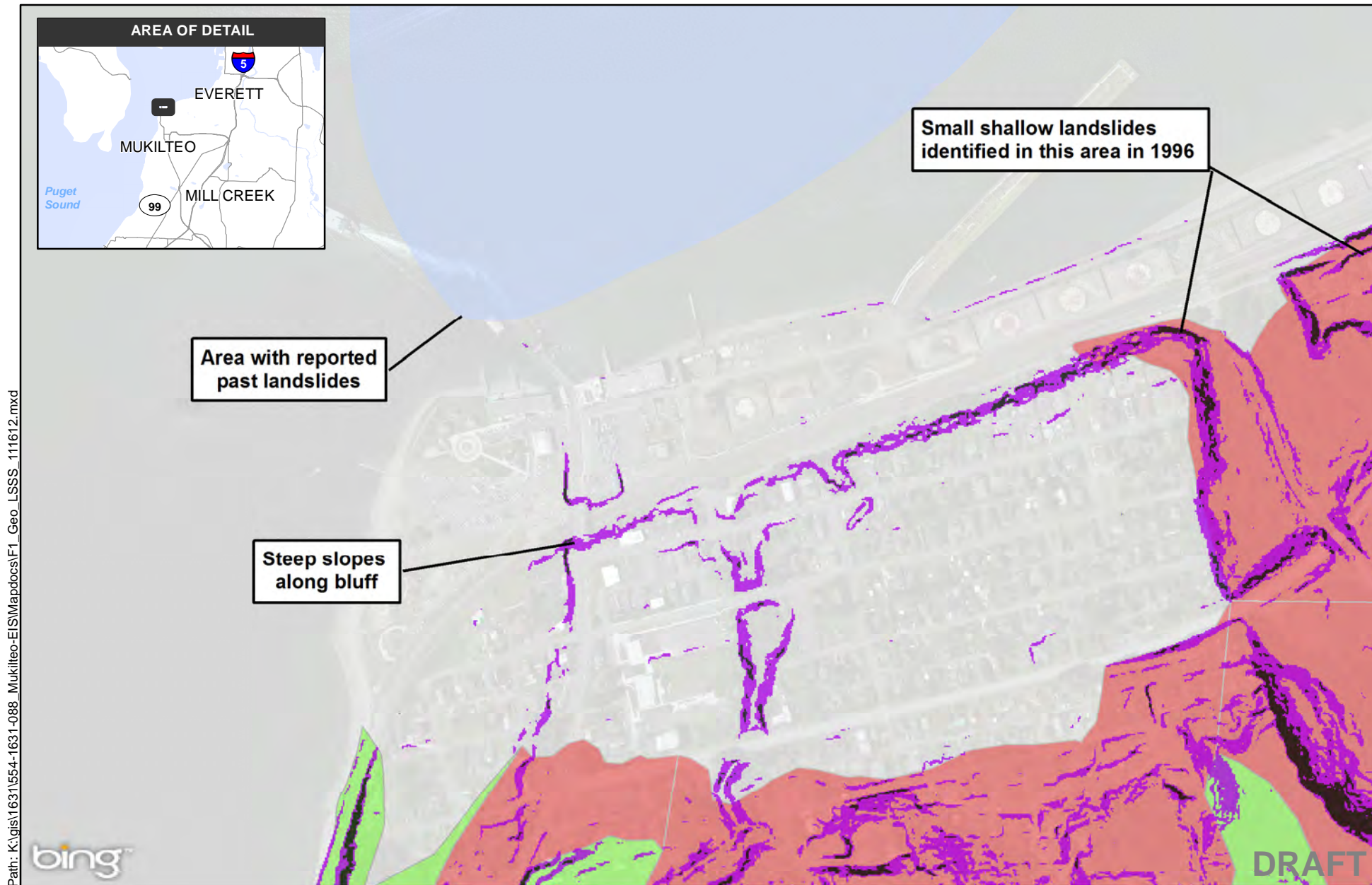
Offshore landslides have the potential to occur in the project area due to the relatively loose nature of the submarine beach deposits and steep slope inclination in the area. A potential large submarine landslide has been identified offshore near the project area (Karlin 2011; Gonzalez 2003). Earthquake events have the potential to trigger onshore and offshore landslides.

### ***Non-Seismic Settlement***

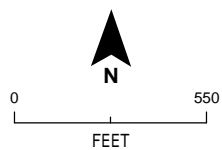
Settlement hazards can result in damage to building and structure foundations and cause cracks in roadways. Settlement hazards in the project area could occur from unsuitable fill material in the project area. Several parts of the project area have been found to contain unsuitable fill materials as evidenced by pavement collapses at the existing terminal and near SR 525 in the past 5 years. Not all of the areas of unsuitable fill material have been completely delineated; therefore, exact locations are not fully known. More information on the extent of these areas will be developed in later design stages of the project.

### ***Earthquakes***

Earthquakes can cause adverse effects from: 1) ground motion, 2) soil liquefaction and settlement, 3) tsunamis, and 4) earthquake-induced landslides (discussed above). The project area is within an active earthquake region. The Southern Whidbey Island Fault Zone is within one-third of a mile of the project area (see Figure 4.10-2).

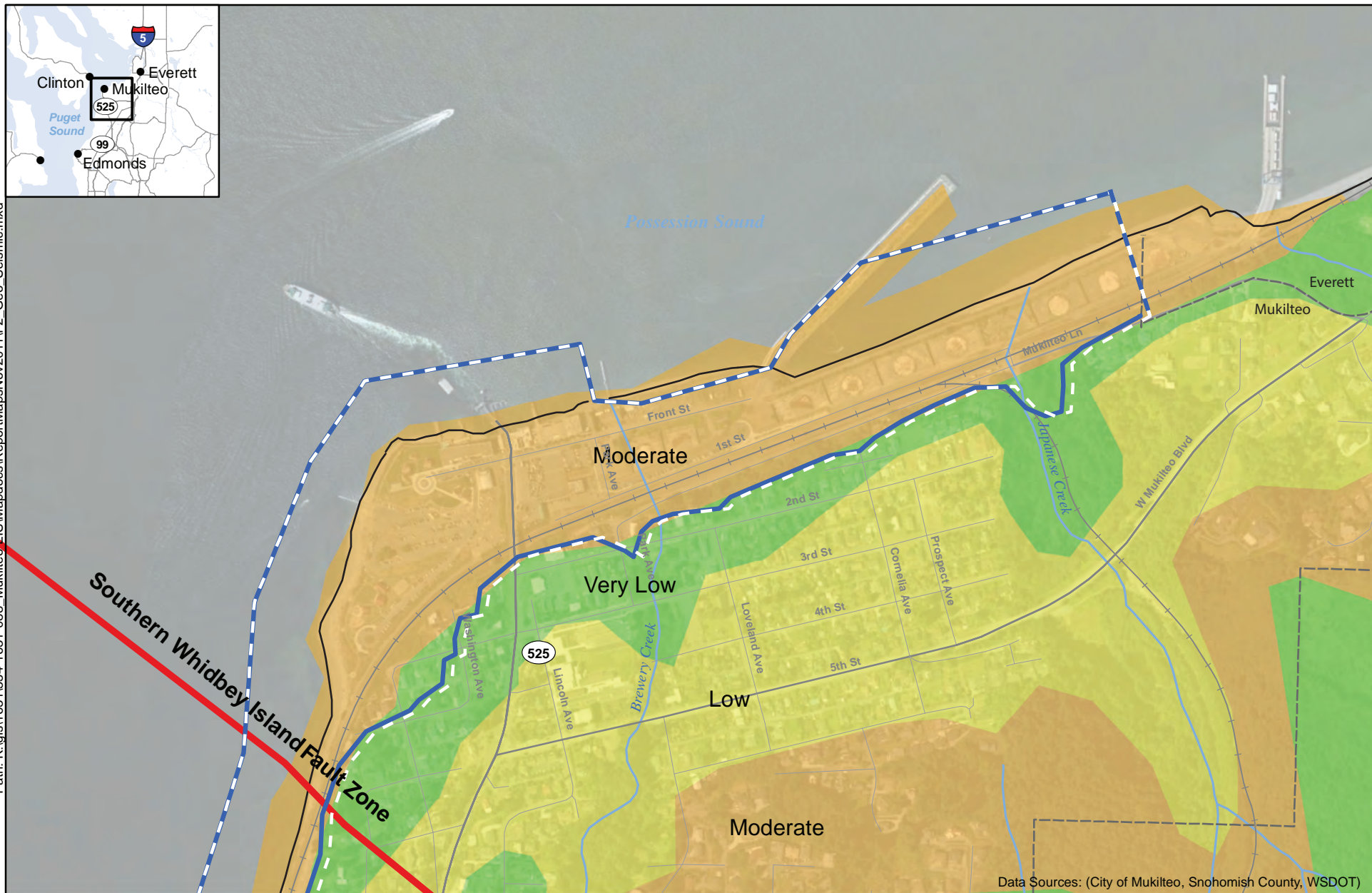


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Data Sources: (WSDOT, LiDAR Puget Sound 2005, City of Mukilteo, Karlin unpublished 2011)

**Figure 4.10-1. Landslide Susceptibility and Steep Slopes**



**Liquefaction Susceptibility**

- Moderate
- Low
- Very Low

- Southern Whidbey Fault Zone
- Tsunami Inundation Area  
(Tsunami data shown only for City of Mukilteo)

- Streams
- City Boundary
- Shoreline

**Figure 4.10-2. Seismic Harzards**

## Ground Motion

Ground motion is the movement that occurs during an earthquake as soil particles move in response to passing seismic waves. Certain soil types can amplify ground motion. The U.S. Geological Survey (USGS) seismic hazard maps and database were used to estimate ground motion parameters for the site at 500-year and 1,000-year events. The results from the evaluation indicate a risk of an earthquake of magnitude greater than 7 from the Southern Whidbey Island Fault Zone.

Ground motion (or shaking) during an earthquake can result in damage or structural collapse to buildings and structures. It also can severely damage roadways, railroads, and utility lines.

## Liquefaction and Settlement

Liquefaction from an earthquake can damage buildings or structures, and pose a threat to public safety. Liquefaction is a phenomenon where saturated soils lose their strength during seismic activity, causing the soil to behave like a fluid. It is most likely to occur in saturated, loose (unconsolidated) sandy soils. Significant adverse impacts may occur to structures and buildings as a result of settlement from the loss of strength and bearing capacity of the soil. Buckling may occur to structures supported by pile foundations. Irregular settlement may break utility lines, resulting in loss of power and water. Adverse impacts may also occur from liquefaction-induced lateral spreading, which can pull apart building foundations, and apply damaging pressure on retaining walls and terminal piles.

Potentially liquefiable soils have been identified throughout the project area and are similar in character for each alternative; however, geotechnical evaluations and studies in the project area suggest the soils are likely to have localized variations.

## Tsunamis

Tsunamis generated from earthquakes, volcanic eruptions, or landslides can devastate coastal regions. A tsunami is a series of waves caused by the displacement of a large volume of water. Damage from a tsunami is caused by the smashing force of tall, fast-moving waves, and the drainage of water receding to the sea.

The potential impacts from tsunami inundation on the existing structures are dependent on wave run-up elevation. Critical factors are the degree of displacement at the source of the wave, the distance of the wave source to the site, and the characteristics of offshore and onshore topography. Modeling indicates the potential for a minor tsunami (1.6-foot wave height) in Mukilteo if an earthquake with a magnitude greater than 7 occurs along the Southern Whidbey Island Fault Zone. The height of the incoming wave could be amplified by tidal stage and offshore slopes.

Other tsunami sources in the project area include large submarine landslides resulting in river delta failure at the mouths of major rivers into the Puget Sound and slope failure of steep submarine slopes. The closest major river delta to the project, the Snohomish River, is located approximately 6.5 miles northeast of the project area. A possible submarine landslide could occur near the project, as mentioned above in the *Landslides* discussion.

## **Volcanoes**

Volcanic hazards from Mount Baker and Mount Rainier could threaten public safety and damage structures. Although a number of hazards are associated with volcanic activity, volcanic ash fall would be the most likely hazard to affect the project area, but overall there is a low potential for significant volcanic hazards in the project area.

### **4.10.3 Long-Term Environmental Impacts**

Long-term impacts on the proposed alternatives may result from seismic and non-seismic geologic hazards identified in the project area. Project alternatives also have the potential to alter existing geologic or hydrogeologic conditions or resources.

#### **No-Build Alternative**

The No-Build Alternative would replace existing structures over time when they reach the end of their design lives, including wingwalls, towers, fixed dolphins, transfer span, bridge seat foundation, concrete trestle, and bulkhead. It would also replace piles supporting the structures. The replacement structures would reduce the likelihood of adverse impacts because new facilities would meet current building codes and standards, including seismic requirements.

#### **Ground Motion, Liquefaction, and Settlement**

Adverse impacts from ground motion are potentially significant because the older existing structures do not meet current seismic codes, reflect new developments in earthquake and tsunami science, or incorporate materials and construction techniques that help reduce the risks related to earthquakes or tsunamis. The existing site has a high potential for earthquake-induced liquefaction and lateral spreading. Adverse impacts include structural damage or catastrophic failure during strong ground shaking from an earthquake. Structures that would be most affected by ground motion are the bulkhead and pile-supported structures.

Adverse impacts on the No-Build Alternative are likely to be greater than impacts under the proposed Build alternatives because the Build alternatives would incorporate more updates in seismic code, engineering design, and construction techniques into new construction and operation. Potential impacts would be reduced as new structures replace older components. In addition, vulnerable older onshore structures that may not be replaced or upgraded under the No-Build Alternative would be more susceptible to damage than new structures during a seismic event.

Non-seismic settlement due to unsuitable fill material does not appear to pose adverse impacts for the No-Build Alternative. The replacement of predominantly offshore structures should not be affected by poor fill because they would be replaced using current engineering standards.

#### **Tsunamis**

Adverse impacts from tsunamis on the No-Build Alternative would be potentially significant. In addition to inundation, structures can be damaged by the high lateral and vertical pressure from the wave currents or from debris transported by the wave that would affect site structures. The wave action and hydraulic forces can cause

substantial scour and erosion undermining buildings and other foundations, causing collapse or other major damage. The generally deteriorated condition of the existing structures and the relatively lower standards to which they were built increase their vulnerability.

### ***Landslides***

Active upland landslides have not been identified near the existing terminal. A high landslide susceptibility zone has been established by the City of Mukilteo under the Critical Hazard Ordinance, but this zone is outside the project area.

A large submarine landslide has been identified in the vicinity of the existing site. The potential impacts to the No-Build Alternative may include undermining foundation structures or removing the lateral capacity of the sediments leading to damage or collapse of offshore structures.

### **Preferred Alternative**

Offshore structures would be constructed to meet current seismic standards, similar to the No-Build Alternative; however, the Preferred Alternative would relocate the ferry terminal and the fishing pier/day moorage from its current location to the middle section of the Mukilteo Tank Farm. A new passenger building, new toll booths, a terminal supervisor's building, and a maintenance building would also be built, and several of these buildings would be multiple stories rather than the single-story buildings on the current terminal.

### ***Ground Motion, Liquefaction, and Settlement***

The Preferred Alternative would be subject to similar moderate to high seismic risks as the No-Build and Existing Site Improvements alternatives. However, stable soils at the Mukilteo Tank Farm occur at shallower depths than at the existing site. The alternative would be largely developed on a vacant site, which allows the project to apply soil strengthening and stabilization measures and foundation supports for structures. Environmental or archaeological considerations may restrict some stabilization techniques, but the major structures are outside of archaeological sites. Design and construction measures would address unsuitable fill material, or weak, compressible, and organic soil, which would help to minimize the risks from seismic effects.

### ***Tsunamis***

Offshore topography would help the Preferred Alternative withstand tsunami-related damage to a greater degree than the No-Build Alternative or Existing Site Improvements Alternative. As with the other Build alternatives, advances in engineering design may be applied to the design of the Preferred Alternative and could reduce impacts.

### ***Landslides***

On land, landslide susceptibility for the Preferred Alternative is greater than the No-Build and Existing Site Improvements alternatives. As presented in Figure 4.10-1, high landslide susceptibility has been established by the City of Mukilteo approximately 350 feet from the closest design footprint. Steep slopes are identified

within 300 feet of the design footprint. However, impacts resulting from slope failure are expected to be low because slope failures are likely to be small, and shallow landslides are unlikely to affect the project.

A large submarine landslide could affect the Preferred Alternative, although the area of the previous offshore landslide is closer to the existing facility. Design measures to stabilize soils and provide foundations for all weight bearing in-water structures would minimize potential impacts to the project. This includes stone columns and deeper foundation supports for the load-bearing offshore structures.

### **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative would include the construction of new wingwalls, towers, fixed dolphins, transfer span and bridge seat foundation, concrete trestle and bulkhead, and the relocation of dolphins from the current facility. New toll booths, a new passenger building, and a new transit center would also be constructed.

### **Ground Motion, Liquefaction, and Settlement**

The anticipated seismic effects for this alternative would be similar to those presented for the No-Build Alternative. However, the improvements to the existing upland structures would reduce the potential damage resulting from strong ground motion, liquefaction, or settlement. The construction of new offshore structures and upland buildings would reflect current seismic design criteria and site-specific geotechnical information. These buildings would be less susceptible to damage from ground motion than unaltered older structures.

The potential for liquefaction impacts to marine structures for the Existing Site Improvements Alternative would be similar to those of the No-Build Alternative, with the exception of upland structures. There is a high liquefaction potential for near-surface soils to depths generally ranging from 10 to 20 feet onshore and to 80 feet offshore. Compliance with current design criteria would make structures safer.

### **Tsunamis**

The potential impacts on the Existing Site Improvements Alternative would be similar to those presented for the No-Build Alternative, although if aging terminal facilities are replaced sooner, they would be better able to withstand lower magnitude events.

### **Landslides**

The potential impacts on the Existing Site Improvements Alternative would be similar to those presented for the No-Build Alternative.

As noted above for the No-Build Alternative, a large submarine landslide has been identified to the north of the existing terminal. Potential impacts on offshore structures would be similar to those identified for the No-Build Alternative. However, with the Existing Site Improvements Alternative, more measures to address seismic risk would be applied, which would help to reduce risks.

## **Elliot Point 1 Alternative**

This alternative would be similar to the Preferred Alternative, but it extends farther east and includes the daylighting of Japanese Creek. It also has a longer trestle and more over-water structures than the Preferred Alternative.

### ***Ground Motion, Liquefaction, Settlement, Tsunamis, and Landslides***

The anticipated seismic effects for the Elliot Point 1 Alternative would be similar to those for the Preferred Alternative except for daylighting Japanese Creek.

Daylighting Japanese Creek would alter soils and hydrology in the project area. This could affect bluffs above the project area. Because the daylighting would occur near areas where ground stabilization measures would be provided both onshore and nearshore, the additional risk of landslides would be limited. In addition, further geotechnical analyses during final design could identify other design measures to minimize impacts.

## **4.10.4 Construction Impacts**

This section discusses potential short-term impacts during project construction to geologic and hydrologic resources, and impacts from erosion hazards during project construction.

Topsoil, fill, aggregate, quarry rock, concrete, and asphalt resources would be used for all alternatives. Some of these materials would be generated by recycling materials from the demolition of existing roads or concrete structures within the project area, while some would consist of quarried materials. Construction contractors would determine the sources of the materials they use for project construction, although WSDOT may make available specific state-owned sources as part of the construction contract bidding process.

## **No-Build Alternative**

Erosion impacts resulting from the No-Build Alternative are not considered to be significant if they are mitigated. Potential erosion of uncovered soils would be limited by BMPs for stormwater management during construction.

Limited amounts of geological resources would be used as fill for the No-Build Alternative; consequently, appreciable impacts to geologic resources are not anticipated.

## **Preferred Alternative**

Construction could increase erosion, especially in areas where soft and loose soil conditions exist. Erosion could occur in areas where construction occurs (both onshore and offshore). The removal of existing offshore structures may increase sediment loss for a short time by disturbing the sediments and introducing them into the water column to be transported off site.

Compared to the No-Build Alternative, a greater volume of geological resources would be used for the Preferred Alternative, particularly for fill, but this would not pose an appreciable impact on geological resources.

### **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative would not significantly increase the erosion hazard. The removal of existing offshore structures may slightly increase sediment loss for a short time by disturbing the sediments and introducing them into the water column to be transported off site.

The use of geological resources as fill for the Existing Site Improvements Alternative would not pose appreciable impacts on geological resources.

### **Elliot Point 1 Alternative**

The erosion hazards and use of geological resources for the Elliot Point 1 Alternative would be very similar to the Preferred Alternative except for daylighting Japanese Creek.

The Elliot Point 1 Alternative would restore Japanese Creek to an open stream, which may potentially increase erosion for a period as the creek re-establishes natural conditions.

### **4.10.5 Indirect and Secondary Impacts**

The greatest risks to the project are impacts from earthquakes. Earthquake impacts include substantial ground motion and soil liquefaction, which have a high potential to affect public safety, cause structural damage, and result in economic disruption. Based on the *Hydrodynamic and Sediment Transport Modeling Study* (Coast & Harbor 2013) prepared for the project, the changes in offshore structures could slightly alter sediment migration, erosion patterns, or deposition.

### **No-Build Alternative**

Under the No-Build Alternative, the potential for major damage to the terminal from an earthquake as a result of inadequate seismic design of existing structures and buildings may affect public safety and disrupt the local economy.

### **Preferred Alternative**

The Preferred Alternative would incorporate current seismic and other engineering standards to address the risk of earthquakes, landslides, or other geologic factors.

Based on information developed as part of the project's design efforts and a review of wind, waves, currents, ferry wakes, and propeller scour, it is unlikely the Preferred Alternative would markedly alter sediment transport patterns.

### **Existing Site Improvements Alternative**

Although earthquake risk is high, new and retrofitted buildings and structures would be built to current seismic safety standards, potentially increasing public safety and decreasing the likelihood of structural damage and economic disruption.

A change in the position of offshore structures under this alternative would not significantly alter sediment transport patterns from current conditions.

## **Elliot Point 1 Alternative**

The indirect effects of the Elliot Point 1 Alternative would be similar to those discussed for the Preferred Alternative, but daylighting Japanese Creek could further alter sediment transport patterns. These changes would be minor.

### **4.10.6 Cumulative Impacts**

Human activities since the late 19th century have substantially changed the topography in the study area. These activities primarily include grading and excavating to construct the Mukilteo Tank Farm, Mukilteo ferry terminal, and BNSF Railway corridor.

Past construction practices were less effective than today's standards in anticipating geologic and seismic hazards, gravel depletion, and soil erosion. Cumulative development in the region has resulted in loss of topsoil and erosion. As the infrastructure has aged, more constructed projects fail to meet evolving seismic design standards. As these trends became evident, roadway and bridge design codes were updated. Development occurring on unstable soils and slopes requires that specific site preparation measures be applied to reduce hazards and to better protect the public. These measures allow facilities to be more capable of resisting seismic events without damage. BMPs are now standard practice in protecting against soil erosion and landslide potential. Construction debris can now be recycled into usable building materials.

Changes that would occur as a result of the project include reworking disturbed soil, making minor grade changes at a local level, and increasing slope stability with ground improvements. These activities are expected to provide improvements in existing geology or soils conditions, which would in turn reduce the potential for cumulative impacts from existing conditions or past actions such as unstable fill or cuts or surface water modifications near steep slopes. Any other future developments in the project area would also be expected to be built to current engineering standards, which also would minimize the potential for adverse cumulative impacts.

### **4.10.7 Mitigation Measures**

This section describes the project's measures to prevent, minimize, or offset long-term and short-term impacts from geologic hazards to structures and the project's impacts to geologic resources. Some of these measures are reflected in the updated project design for the Preferred Alternative, but details will continue to be refined during the final engineering design phases of the project.

#### **Mitigation for Long-Term Impacts**

##### ***Preferred Alternative***

The following long-term mitigation measures would be implemented:

- During preliminary and final design, geotechnical engineering would further characterize existing geologic hazards for incorporation into the final engineering design. These hazards would include, but not be limited to, landslides (onshore and offshore), steep-cut slopes, soil liquefaction, and settlement. Additional site-

specific assessments may include the use of geotechnical drilling, test pitting, material testing, geophysical techniques and/or inclinometers, and monitoring wells, as needed. These assessments would be based on the recommendations of the project geotechnical engineer and will comply with WSDOT geotechnical design standards.

- In the later stages of project design, WSDOT would define the specific stabilization techniques that would be used to minimize liquefaction of soils.
- The project would adhere to City of Mukilteo and City of Everett regulations regarding critical area regulations to safeguard public health, safety, and welfare, as well as protect sensitive areas and their functions and values. These regulations address protection of public health and natural resources from injury, loss or damage from landslides, steep slope failures, erosion, seismic events, liquefaction, tsunamis, and flooding.
- WSDOT would design and build facilities to meet seismic standards and other applicable federal, state, county, and city engineering and design codes or standards. Structural designs will take into consideration ground motion, liquefaction, lateral spreading caused by earthquakes, and information on tsunami risks.

### **Other Alternatives**

The mitigation measures for the other alternatives would be similar to those described for the Preferred Alternative.

### **Mitigation for Construction Impacts**

WSDOT would adhere to applicable local regulations regarding grading and excavation. These regulations address preserving, enhancing, or replacing understory and groundcover (*Section 4.12 Ecosystems*); minimizing degradation of water quality and sedimentation of creeks; minimizing impacts of increased runoff erosion and sedimentation; and protection of groundwater resources (*Section 4.11 Water Resources*). Grading, excavation, and/or the removal of topsoil and vegetative cover would require local permits (*Section 4.2 Land Use and Economics*).

## **4.11 Water Resources**

This section discusses the potential impacts the proposed alternatives may have on marine water, surface water, and groundwater. Marine and freshwater habitats are discussed in *Section 4.12 Ecosystems*, and groundwater is also discussed in *Section 4.8 Hazardous Materials*.

### **4.11.1 Regulatory Context**

NEPA and SEPA both identify water resources as a required area of environmental analysis. The Clean Water Act (CWA) is the primary federal law governing water quality in the United States. Numerous federal and state regulations and permits, many of which are under the authority of the CWA, control activities ranging from discharges into United States waters to construction or fill within certain waters. For instance,

surface water quality standards are implemented through CWA Section 401 certifications and comply with the Water Pollution Control Act and Washington State's Water Quality Standards. Groundwater standards protect existing and future beneficial uses of groundwater from contaminated discharge. WSDOT also must comply with its National Pollutant Discharge Elimination System (NPDES) permit and the WSDOT *Highway Runoff Manual*, which was developed to comply with Ecology's 2007 *Stormwater Management Manual for Western Washington*. Ecology has updated the manual in 2012, and WSDOT will update its manual when its next NPDES permit is renewed.

#### **4.11.2 Affected Environment**

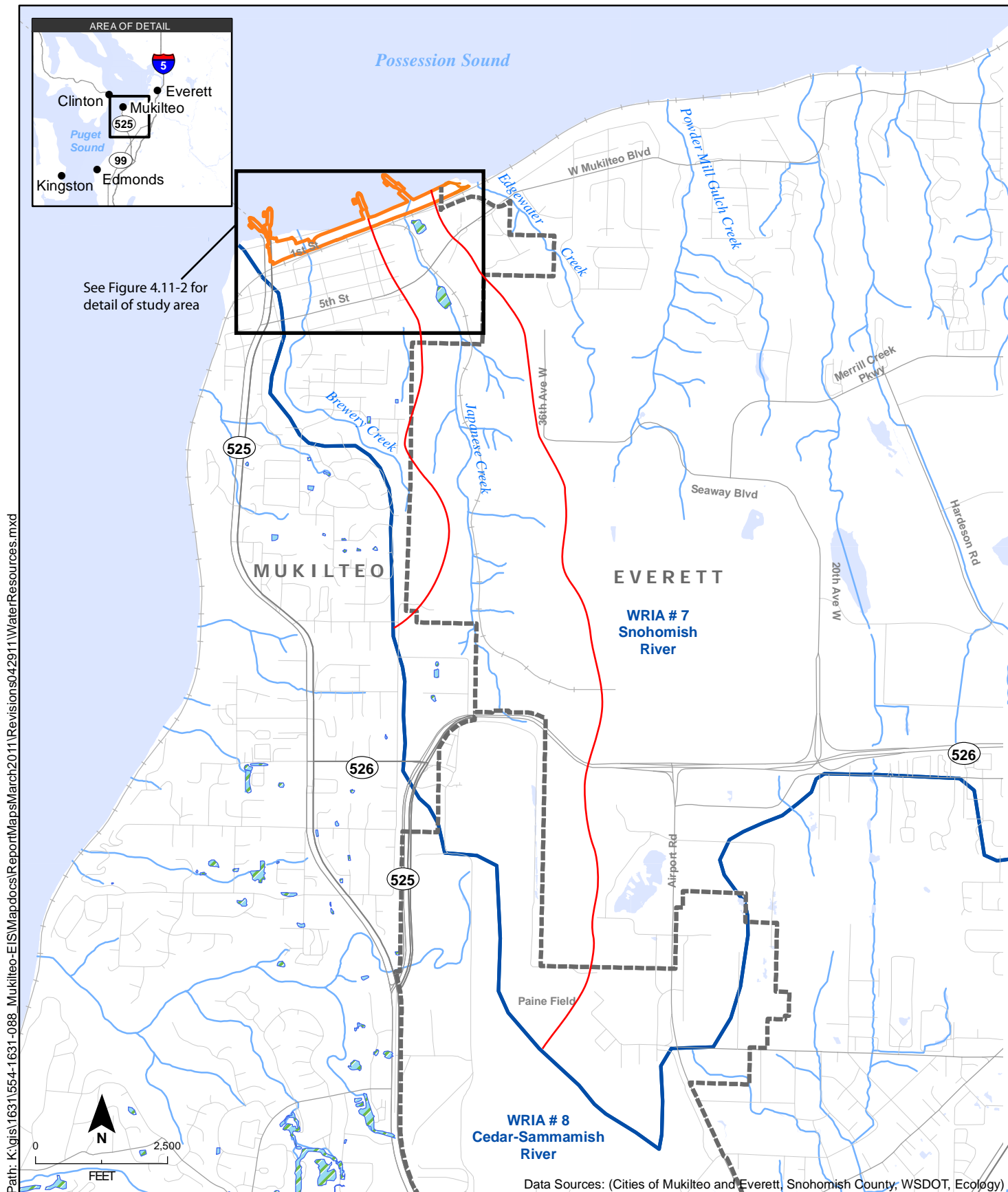
The study area includes all water resources within the immediate vicinity of the project alternatives. The study area is limited because the alternatives are all located along the shoreline, and upland effects on water resources would be limited to the effects occurring within the area of construction, primarily along the shoreline. Upland parts of the study area are generally one edge of the alternatives and Possession Sound is the other. Figure 4.11-1 shows the larger watershed context of the project, while Figure 4.11-2 shows the more localized features surrounding the project. The study area is located within the southern part of Water Resource Inventory Area (WRIA) 7, Snohomish River, and adjacent to WRIA 8, Cedar-Sammamish River.

The project area lies north of the BNSF tracks along the Mukilteo waterfront. Most of the area has been graded and filled for existing development and is relatively flat. Across the project area there is less than a 10-foot change in elevation. Beyond the railroad tracks is a relatively steep hillside and bluff section. SR 525 descends this hillside to the existing Mukilteo ferry terminal.

#### **Water Resources in the Study Area**

The major water resources within the study area are Possession Sound, Japanese Creek, and Brewery Creek. Both creeks descend to the flat area within the study area and may receive some groundwater flow collected from under the surface as the topography flattens near the beachfront. There are no documented wetlands within the project area.

Possession Sound is located at the northern portion of the study area. It provides an environment for aquatic life; opportunities for recreational boating, fishing, and swimming; and tidelands that provide opportunities for beachcombing and shellfish harvesting. It also enables commerce and navigation throughout the region. The shoreline of Possession Sound in the study area is shaped by tides, wind, and wave action. Currents run parallel to the shore, moving sediment from the adjacent streams.



- ▬ Project Area
- ▬▬▬ City Boundary
- ▨ Wetlands
- ▬ Streams
- ▬ Waterbodies
- ▬▬▬ WRIA Boundary
- ▬ Stream Basin Boundary

**Figure 4.11-1. Water Resources in the Project Vicinity**

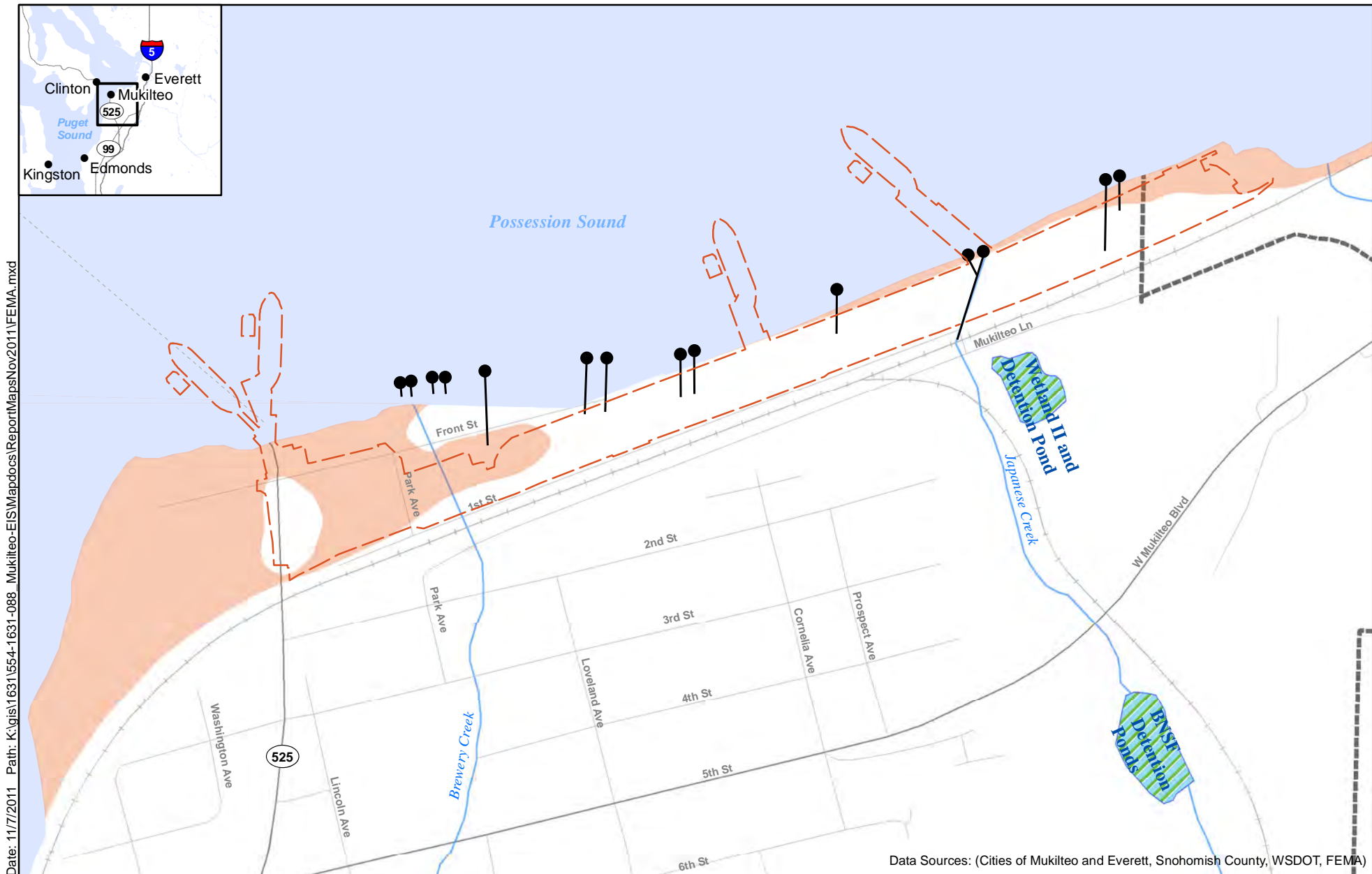


Figure 4.11-2. Water Resources in the Study Area

Japanese Creek originates near Paine Field Boulevard in Everett and flows north toward the project area through a steep narrow ravine known as Japanese Gulch. After descending through Japanese Gulch, the stream flows into a culvert (that is a partial fish barrier) under the BNSF railroad tracks, and enters an underground vault on the north side of the railroad tracks. Stream flows then are diverted into two routes. The first route is a 42-inch-diameter culvert extending through the existing Mukilteo Tank Farm site and entering Possession Sound. The second route is a 48-inch-diameter pipe extending east along the railroad tracks to an outfall at the Mount Baker Terminal. There are documented cutthroat trout, Chinook salmon, and coho salmon in the creek.

Brewery Creek originates south of the project area, and its drainage basin includes most of downtown Mukilteo. The stream channel gradient in the upper basin is relatively steep, but it flattens considerably through the downtown area. The stream is enclosed within a pipe system as it passes through the downtown waterfront area before it is discharged through an outfall into Possession Sound. No fish have been documented in Brewery Creek.

## **Water Quality**

Possession Sound is included on the 2012 Washington State Water Quality Assessment [303(d)] list (Ecology 2012) for not meeting necessary quality criteria for fish habitat, and for exceeding thresholds for dissolved oxygen, fecal coliform bacteria, and dioxin. A designated total maximum daily load (TMDL), which sets the maximum amount of a pollutant allowed to be released into a waterbody, is in place for dioxin.

The water quality in Japanese Creek and Brewery Creek is impaired due to urbanization in the drainage basins. Data obtained from Japanese Creek from 1994 through 2012 show that the stream does not meet the state water quality criteria for fecal coliform bacteria, lead, turbidity, pH, dissolved oxygen, cadmium, and copper.

Previous studies completed for the City of Mukilteo confirmed that oil from the existing ferry holding area is degrading the water quality in Brewery Creek (TetraTech/KCM et al. 2001). Water quality in the creek is also likely degraded by a variety of pollutants typically found in urban runoff in the Puget Sound area, including heavy metals, hydrocarbons, and synthetic organic compounds.

## **Groundwater**

A former lagoon area at the base of the hillside, now covered with fill, acts as a small groundwater recharge zone, with groundwater observed 7 to 10 feet below the surface elevation. Groundwater levels are highly dependent on tidal conditions, ranging from +6.1 feet above mean lower low water (MLLW) at low tide to +11.3 feet MLLW at high tide. The study site overlies the Intercity Plateau Aquifer, which is not used for drinking water. Municipal drinking water for the city of Mukilteo comes from the Spada Reservoir. At low tide, the groundwater flows north. At high tide, the water table near the northern boundary of the site reverses direction and flows south. The groundwater is recharged by on-site and off-site infiltration of rainwater, and from the aquifer in the uplands to the south. The majority of the project area has been paved. Paved surfaces minimize the infiltration of surface water, reducing the transport of

possible contaminants migrating out of the area through the groundwater and into Possession Sound.

Soils and groundwater underlying portions of the study area were contaminated with petroleum hydrocarbons and heavy metals (Herrera 2003) as a result of past uses of the Mukilteo Tank Farm. After remediation between 1997 and 2002, monitoring results showed that soil, groundwater, surface water, and marine sediment were compliant with all provisions of the Ecology-approved compliance monitoring plan (Oasis 2006) (for additional information, see *Section 4.8 Hazardous Materials*). However, project-related archaeological trenching and boring conducted in 2006 and 2007 found petroleum and other contaminants in soils on the west and central portions of the property. Therefore, despite past cleanup efforts, it is possible that minor residual contamination is still present beneath the ground surface in some areas.

### **Stormwater**

Currently, moderate amounts of pollutants in stormwater runoff are generated within the study area by vehicle traffic, routine business uses, and the ferry terminal operations. Additional pollutants may enter the stormwater runoff from the former Mukilteo Tank Farm operations, atmospheric deposition, and wildlife fecal matter. Multiple stormwater outfalls within the study area discharge into Possession Sound (see Figure 4.11-2).

### **Flooding**

A portion of the study area is mapped by FEMA within a 100-year floodplain (see Figure 4.11-2). The 24-inch-diameter outfall for the Brewery Creek culvert is not equipped with a tide gate. At certain high tides, high waves cause water to back up in the culvert. When this occurs, the streets near the intersection of Front Street and Park Avenue in downtown Mukilteo can flood up to 18 inches, particularly when rainstorms coincide with high tides. Based on hydrologic modeling conducted by the City of Mukilteo, flooding near the Brewery Creek outfall is expected independent of tidal conditions during 25-year storm events. This flooding would occur because of the limited capacity of the stream culvert pipe. If a high tide coincides with this type of flooding event, flooding could spread to many areas along the waterfront. No other flooding is known to occur within the study area.

### **Aquatic Vegetation**

Macroalgae and eelgrass surveys along the shoreline have been completed in the study area, and are discussed in *Section 4.12 Ecosystems*. While aquatic vegetation is present throughout the area, it is sporadic. The larger areas with vegetation are to the east of the site.

#### **4.11.3 Long-Term Environmental Impacts**

All alternatives may affect water resources in several ways. Possible impacts may result from stormwater runoff from impervious surfaces (roadways and parking areas) entering the water resources; shading from the ferry pier; placement of piles and buildings within the nearshore area and the vegetated shoreline; creation of new sediment patterns; and unanticipated spill of hazardous materials. Impacts on water resources would generally be similar under all alternatives.

## Stormwater

The Preferred Alternative would create approximately 10.2 acres of pollution-generating impervious surface (PGIS); no PGIS would be removed, but some would be replaced or relocated.

Stormwater from the existing terminal vicinity is currently discharged untreated to Possession Sound. Runoff from the Preferred Alternative would receive enhanced treatment. Stormwater would be captured by shrub/tree vault treatment catch-basins, with piping from the catch-basins to either outfalls or to bioretention areas. The slope and depth of piping would be minimized in order to avoid deep trench excavations, which would avoid or minimize conflicts with groundwater, the shell midden, and soil contaminants. The west end of the site would be routed to an existing 24-inch pipe outfall. The center of the site would be routed to an existing 30-inch outfall. Water from the eastern portion of the site would be routed to a new outfall.

The Preferred Alternative would provide enhanced stormwater treatment for all new PGIS. Treatment would be provided by filtering cartridges installed underneath the holding area or by natural bioretention systems. Infiltration (permeable pavement) could be used for stormwater treatment at the east end of the site. Field testing during final design would be performed on any areas proposed for infiltration to confirm areas suitable for infiltration (where the surface water can be infiltrated without it combining with contaminated soil or groundwater). If field testing shows that soils or groundwater are contaminated beyond acceptable limits, infiltration would not be used, and water would be discharged via the new outfall.

Site-specific cleanup levels already established for the property would be used to determine acceptable levels for groundwater and soil contamination (see *Section 4.8 Hazardous Materials*).

Notwithstanding WSDOT's intention of trying to infiltrate some of the runoff, the stormwater analysis conservatively assumes no infiltration. If infiltration issued, actual pollutant loads would be less than what is presented here. WSDOT would notify the National Marine Fisheries Service and U.S. Fish and Wildlife Service if the final design of stormwater treatment methods differs from what is discussed in this EIS and *Appendix L Biological Assessment*.

For all of the Build alternatives, increased land cover would generate more pollutants. The project site is exempt from current flow control requirements because stormwater runoff is discharged directly into Possession Sound; however, increased flows could exceed the capacity of the existing enclosed drainage conveyance system leading to the Sound.

The No-Build Alternative would retain nearly the same footprint as the existing condition. It would contribute the largest amount of stormwater-related pollutants to Possession Sound because only minimal stormwater retrofit requirements would be implemented.

The Existing Site Improvements Alternative would have a similar amount of impervious surface as the No-Build Alternative, but would include adequate stormwater treatment facilities.

The Elliot Point 1 Alternative would have the most impervious surface among alternatives; therefore, larger stormwater treatment facilities would be included to meet current requirements.

### **Flooding and Shoreline Effects**

Because most of the existing flooding in the waterfront area is related to high tides or storm surges, none of the alternatives would generate an increased risk of flooding due to changes in stormwater runoff flows. Any new outfalls would be designed and sited to prevent occasional tidal backwater impacts from flooding the site and adjacent areas. If necessary, tide gates could be added, or larger conveyance pipes could be used for extra storage to address combined high storm and tide events.

The project's *Hydrodynamic and Sediment Transport Modeling Study* (Coast & Harbor 2013) examined the potential for impacts from wave action or currents on the shoreline and sediments. The analysis also considered the forces generated by ferry propellers. None of the alternatives would cause shoreline erosion or notable erosion in the bottom slopes or sediments. The Preferred Alternative would have the deepest water berth, and would have limited effects due to scouring. The Existing Site Improvements Alternative is in an area that lacks sediments, in part due to the existing terminal; additional sediment scour is not expected. The nearby shoreline area and bulkheads would also be reconstructed as part of the new terminal facility, which would further protect against erosion of the shoreline particularly during storm events.

The No-Build and Existing Site Improvements alternatives are located within the FEMA 100-year floodplain (see Figure 4.11-2), which poses a risk to future terminal operations. A small portion of the Elliot Point 1 Alternative is located within the FEMA 100-year floodplain, but the future risk to terminal operations would be much lower than for the No-Build and Existing Site Improvements alternatives. The Preferred Alternative is not located within the FEMA 100-year floodplain.

### **Marine Vegetation**

Water quality can be affected if nearshore aquatic vegetation is shaded. The lack of sunlight can reduce photosynthetic activity and alter dissolved oxygen levels in the immediate area.

For all alternatives, shading would generally be similar to or less than the existing conditions for the No-Build Alternative. The Existing Site Improvements Alternative would increase over-water coverage by about 12,000 feet, compared to a gain of 3,000 square feet with the No-Build Alternative. The Preferred Alternative has a shorter pier than the Elliot Point 1 Alternative, and removes the existing facility and the Tank Farm Pier for a net removal of about 129,100 square feet of over-water cover. It also removes the existing Port of Everett fishing pier and day moorage and relocates it on the Mukilteo Tank Farm site. The Elliot Point 1 Alternative has the largest pier and greatest amount of new over-water coverage, but also removes the existing facility and Tank Farm Pier, resulting in a net removal of about 116,000 square feet of over-water cover. For all alternatives, the effect on marine vegetation would be limited to the immediate project area and is not anticipated to result in

measurable impacts on aquatic life or water quality (see *Section 4.12 Ecosystems* for more information).

## **Sediment**

Wave action and sediment drift along the shore could be altered by the bulkhead bank protection, anchor chains leading from the floating dolphin structures to seafloor anchors, new piles supporting the ferry terminal pier, and removal of piles supporting the Tank Farm Pier and the existing ferry trestle. As noted above under *Flooding and Shoreline Effects*, propeller-driven currents during ferry docking are not expected to notably disturb Possession Sound's bottom slopes or sediments near the ferry terminal.

As discussed in more detail in *Section 4.8 Hazardous Materials*, WSDOT also assessed existing sediment quality near the Tank Farm Pier. While some of the sediment samples show traces of several contaminants, primarily pesticides, there would be a low risk of additional contamination to area sediments due to the relatively low levels of contaminants present, and because sediment transport would be limited.

## **Over-Water Spills**

Under all alternatives, ferry terminal activities would occur over water and within nearshore areas. Such activities would include docking of ferries, operation of the vehicle transfer span, loading and unloading of vehicles, and collection of wastes and other activities related to increased human presence. Small fuel leaks, engine fluid releases, garbage, and spills of other harmful materials could escape containment and collection, resulting in adverse impacts on the offshore and nearshore water resources.

The pier for the Preferred Alternative is approximately the same size as the No-Build Alternative pier and the risk of spills is expected to be similar. The Existing Site Improvements Alternative has a larger over-water structure compared to the No-Build Alternative, resulting in a slightly higher risk of over-water spills. The larger pier for the Elliot Point 1 Alternative with additional over-water vehicle use and equipment operation would pose the highest potential for accidental over-water spills.

### **4.11.4 Construction Impacts**

Construction impacts are short term and temporary because they are confined to the duration of construction activities. Potential impacts on water quality may result from removal of existing buildings and piers, relocation of utilities, other land-disturbing activities, dredging of sediments, construction of new buildings and trestles, and removal and installation of other in-water features, including bulkheads. Many of the construction impacts would be similar for the four alternatives being considered.

## **Impacts Common to All Alternatives**

All of the alternatives have construction activities that could affect water quality. Demolition of existing features may inadvertently convey contaminants into water resources, impairing water quality. Wind-blown dust from exposed surfaces and other fugitive dust from construction materials containing contaminants could be carried to adjacent water resources. As discussed below, other sources of potential impacts include excavation in upland areas where groundwater may be encountered, construction or

demolition in-water where sediments may be disturbed, or the potential for accidental spills of fuel or other materials when construction activities are near water.

### ***Dewatering***

If water is encountered during excavation and construction activities, dewatering of selected areas may be required. Dewatering typically involves pumping groundwater out of a construction area to temporarily lower the water table elevation, allowing work to be done in a relatively dry condition. Within the study area shallow groundwater exists at 7 to 10 feet bgs. While few elements extend that deep, some excavation related to foundation and structural elements or removal of utilities could extend to these levels; if it does, dewatering activities may encounter contaminated groundwater, and could cause contaminated groundwater to migrate.

### ***Sediment, Turbidity, and Water Quality***

Upland construction activities could also result in soil erosion, which could lead to sediment entering stormwater runoff. If not handled in accordance with applicable construction procedures and permits, this runoff could enter Possession Sound through stormwater systems, culverts, and overland flow.

Water quality at the saltwater intake system for the NOAA Mukilteo Research Station is not expected to be affected by most construction activities, such as construction of an over-water platform and placement of anchors. If toxic chemicals were suspended from the marine sediment layer or from creosote piles during removal, the associated concentrations in the water column would be diluted, and sediments would be carried away by wave action or would settle back onto the bottom of Possession Sound in a relatively short time after entering the water column. The suspension of contaminants in the water column would be temporary, and no long-term degradation of intake water is expected. Even if turbidity associated with construction were to enter the intake system, water quality for the NOAA Mukilteo Research Station is not likely to be adversely affected because the intake system is filtered. Coordination with NOAA research staff before and during sediment-disturbing activities would help avoid impacts.

All of the alternatives have fixed dolphin structures, wingwalls, a trestle, and an overhead pedestrian walkway; for their construction, WSDOT would need to drive or drill steel or concrete piles into the sediment. The driving of solid-cast concrete piles into sediments would displace sediments and temporarily increase turbidity. Installing hollow steel piles would create less water column turbidity, but may require the disposal of contaminated sediment from inside the pile casing prior to concrete pouring. If displaced water within the hollow piles or drilled shafts is not removed and managed carefully, uncured concrete could make contact with marine water, locally increasing the pH and turbidity of the water.

The *Hydrodynamic and Sediment Transport Modeling Study* (Coast & Harbor 2013) addressed construction impacts from dredging, pile removal, and stone column installation. The study concluded that with the application of BMPs and other standard construction control measures, construction would not generate turbidity levels above regulatory impact criteria.

To construct new or upgraded drainage outfalls for any of the alternatives, WSDOT would need to excavate in some areas along the shoreline, and construction control measures would be needed as part of required water quality permits for the project.

For the Preferred Alternative or the Elliot Point 1 Alternative, WSDOT would remove the Tank Farm Pier and dredge a navigation channel through an existing sediment berm where the pier is currently located. While measures would be in place to minimize impacts, these activities could suspend sediments that could escape collection, and small turbidity plumes could occur in the nearshore area. Higher levels of turbidity would reduce penetration of light in the water column, and this could temporarily reduce productivity of aquatic plants and algae that form part of the food chain.

To meet seismic and other structural engineering standards for facilities such as the passenger buildings and the trestle, WSDOT may need to use stone columns to stabilize soils nearby. The stone columns would be installed by air injection or water jetting to advance the stone column probe past dense soil layers. These activities could suspend bottom sediments and create localized increases in turbidity. However, with the use of standard BMPs, the modeling study predicted turbidity levels would be lower than regulatory limits (Coast & Harbor 2013).

Dredging may also affect water quality by resuspending bottom sediments, which would increase turbidity and allow the potential movement of sediments. This is typically done by using excavation buckets to place sediments on a barge. The modeling analysis found that turbidity would increase where the dredging is occurring, but typical BMPs and other measures required by permits would limit the turbidity and sediment movement effects to within the dredging area (Coast & Harbor 2013). *Section 4.8 Hazardous Materials* further discusses issues related to sediment quality and potentially contaminated sediments.

## **Spills**

There is an inherent risk of water quality impairment with in-water and waterside construction activities. For example, the rupture of a hydraulic fluid line on a work barge or other heavy construction equipment could cause toxic material to spill into open waters. Equipment used to construct the in-water structures may leak small amounts of fuel and engine fluids into Possession Sound. However, use of effective and required pollution prevention measures would reduce the risk of such potential spills.

If an accidental spill of fuel, lubricant, or septic material should occur during construction, shallow groundwater underlying the project area could become degraded. If a large spill occurs on exposed soil, and sufficient containment and cleanup measures are not implemented, the contamination could be significant enough to adversely affect nearshore water quality in Possession Sound. However, it is highly unlikely that a spill of this magnitude would occur during construction. Applicable spill control measures are described in *Section 4.11.7*.

The construction effects on water resources specific to each proposed alternative are discussed below.

## No-Build Alternative

The No-Build Alternative would demolish and replace existing buildings. This action could potentially contaminate nearby water resources with construction materials if containment BMPs are not adequately implemented.

## Preferred Alternative and Elliot Point 1 Alternative

The Preferred and Elliot Point 1 alternatives would have many of the same impacts, which would be greater than for the No-Build or the Existing Site Improvements alternatives. The removal of the Tank Farm Pier and its support piles would result in nearshore turbidity plumes. Dredging would result in temporary impacts from the removal and suspension of sediments. Creosote-related hydrocarbons, which are harmful to marine organisms, may have leached from the Tank Farm Pier piles into the surrounding sediment (Herrera and Mossatt & Nichol 2006). Wave action and currents could then transport the resuspended contaminants to nearby areas of Possession Sound. However, WSDOT's modeling analysis indicates turbidity impacts would be limited to areas within 150 feet, and most of the sediment that could be moved would resettle within 1,500 feet and would not adversely alter sediment quality in adjacent areas. See *Sections 4.11.2, 4.8 Hazardous Materials, and 4.12 Ecosystems* for more information.

Increased stormwater infiltration into the groundwater table and adjacent open stream sections may result from pavement removal and replacement and other land changes. Water quality may be affected if runoff is conveyed through the potentially contaminated soils described in *Section 4.11.2*.

Dewatering may be necessary to allow for construction to be completed in relatively dry conditions. Stormwater facilities are expected to require excavation over a small portion of the site, less than 10 percent of the total area, at depths of 5 feet bgs. The proposed stormwater system would tie into an existing outfall at 10 feet bgs.

## Existing Site Improvements Alternative

In comparison with the No-Build Alternative, the Existing Site Improvements Alternative would have more land-disturbing activities and excavation, which would increase the potential for erosion and construction dust that may affect water resources. The steeper slope associated with the existing holding lanes for this alternative would also increase the potential for erosion relative to the Preferred and Elliot Point 1 alternatives where the grade is flatter.

### 4.11.5 Indirect and Secondary Effects

Over time, creosote-treated wood in the piles at the existing terminal site and the Tank Farm Pier have likely contaminated and are still contaminating the marine sediment beneath them. All alternatives involve the removal of creosote-treated piles at the existing terminal site. In addition, the Preferred and Elliot Point 1 alternatives would include removal of the Tank Farm Pier and some underlying sediments, while the No-Build and Existing Site Improvements alternatives would not. Removal of all these sources of pollution could have a long-term beneficial impact on the water quality in the project vicinity.

#### 4.11.6 Cumulative Effects

Population growth and resource use have contributed to degradation of water quality in the region. The polluting of Puget Sound became a controversial issue as far back as the 1920s, when shellfish growers sought protection from the pollution from early pulp mills. The Pollution Control Commission was finally established in 1945 to control pollution. Decades later, a flurry of major state and federal environmental laws was passed between 1965 and 1973 in light of growing awareness of environmental problems. In the late 1970s and early 1980s, a number of events caused broad public concern about conditions in Puget Sound, including reports of toxic contamination, closures of shellfish growing areas, sightings of dead whales, and declines in some fish stocks. The resulting public outcry produced initiatives to improve the water quality of Puget Sound, which continue to this day.

The long-term trend is the slow improvement in water quality resulting from regulatory requirements for treating discharges of water to receiving resources. As redevelopment occurs, requirements are triggered and updated methods of treating and managing discharges are implemented. For the reasonably foreseeable future, without considering the proposed terminal improvement project, several nearby projects will help improve water quality by reducing pollution and retrofitting older stormwater systems. In addition, the region has invested in public education and pollution prevention programs, which will assist in preventing contaminants from reaching the receiving water resources.

This project and several nearby projects would trigger requirements for implementing retrofit measures to ensure water quality treatment. The cumulative impact would be beneficial by improving water quality, reducing pollution, and updating aging stormwater systems, which often develop leaks and thus introduce additional pollutants to downstream resources.

Other actions planned or recently completed in the study area include:

- Transfer of the U.S. Air Force Mukilteo Tank Farm to Port of Everett and NOAA
- Port of Everett Tank Farm Master Plan
- Sound Transit Mukilteo Station South Platform Project
- NOAA Mukilteo Research Station Expansion
- Port of Everett Mount Baker Terminal
- City of Mukilteo Shoreline Master Plan—Restoration of Japanese Creek

Although WSDOT is coordinating with the sponsors of these projects, separate actions could be taken even if the Mukilteo Multimodal Project is not developed. For more information on these projects, see *Chapter 2 Alternatives*.

As with the Mukilteo Multimodal Project, other projects would implement required water quality treatment, provide erosion and sediment control measures, and carry out other actions to protect water resources. Therefore, the proposed project, in combination with past, present, and reasonably foreseeable future projects, would

likely contribute to an incremental improvement in stormwater runoff quality, and decrease the pollutant loading to Possession Sound.

#### **4.11.7 Mitigation Measures**

This section describes the mitigation measures that would be required for protection of surface water and groundwater as well as additional mitigation measures that could be implemented to prevent, avoid, and minimize negative impacts on water resources. These measures include BMPs implemented during construction activities as well as long-term measures.

During design, opportunities to apply low-impact development techniques may be identified.

#### **Climate Change Adaptation**

As the stormwater design is developed, the potential impacts of climate change will be taken into account. Rising sea level may affect the floodplain, drainage outfalls, and stream levels. Temperature change and storm patterns may bring higher intensity precipitation, stronger winds, and higher storm surges. Drainage facilities, such as conveyance pipes, may need to be enlarged to handle increased rainfall runoff and provide storage for additional stormwater volumes that may result from water backing up due to sea level rise. Project components at the water edge will be designed taking into consideration the potential for higher sea levels (*see Section 4.9 Energy and Climate Change* for more information). Upland stormwater systems likewise may be designed to minimize potential flooding due to projected increases in precipitation and sea level. The installation of flap gates to prevent saltwater from backing up into the enclosed drainage would be evaluated as part of final design. WSDOT will also consider federal, state, and local guidance regarding design considerations for rising sea levels during final design.

#### **Mitigation for Long-Term Impacts**

The risk for potential impacts on stormwater discussed in *Section 4.11.3* would be minimized by incorporating appropriate stormwater treatment measures in the project design, and in accordance with permits that would apply to all alternatives, including the permits needed for the facilities to be reconstructed under the No-Build Alternative. These features and measures would be similar to those described below for the Preferred Alternative.

#### **No-Build Alternative**

The No-Build Alternative would retain the same footprint as the existing conditions, with most change affecting structures or in-water elements. Therefore, it would trigger the fewest stormwater retrofit requirements.

#### **Preferred Alternative**

After the implementation of design features, BMPs, and other components included in the Preferred Alternative, or as part of the mitigation defined in other environmental topic areas, no additional mitigation would be needed.

Stormwater would be treated in accordance with required permits, which call for the use of BMPs prior to being released to surface water. BMPs may consist of ponds, vegetated areas, biofiltration swales, filters, constructed wetlands, or other features and emerging technologies designed to treat for the removal of pollutants from stormwater runoff. Also, landscaping and exterior cleaning practices would include measures to protect water resources.

Drainage conveyance systems would meet applicable requirements for stormwater discharge into Possession Sound; these requirements are in place to minimize the potential for water quality impacts.

### ***Existing Site Improvements Alternative***

The Existing Site Improvements Alternative would replace existing pavement with new paved surfaces. Stormwater runoff from the upland areas of the project would be treated prior to discharge to Possession Sound in accordance with treatment requirements. A vault system is one of the potential treatment facility types that could be considered.

### ***Elliot Point 1 Alternative***

For the Elliot Point 1 Alternative, the drainage system for the new PGIS could use bioretention or comparable facilities to treat runoff from areas subject to vehicular traffic. A bioretention facility that provides treatment through binding metals to the soil and uptake of pollutants by plants would be expected to provide better treatment than a vault, which treats through settlement only (Ecology 2005). Drainage runoff from upland areas of the project site would be treated before discharging to Possession Sound, reducing the average annual pollutant load discharged to the Sound from stormwater runoff. Overall, Elliot Point 1 stormwater facilities would be similar to those for the Preferred Alternative.

## **Mitigation for Construction Impacts**

### ***Preferred Alternative***

Measures to reduce turbidity and wave action impact on the shoreline during pier removal could include cutting off the piers at ground elevation, collecting and treating construction stormwater, and complying with the project's applicable permitting conditions.

Measures to prevent infiltration and contain the dewatering activities would be required in selected areas. It would also be necessary to treat water that had been pumped or otherwise isolated during dewatering before release into Possession Sound.

For any construction work within or above water, a Hydraulic Project Approval (HPA) would be required from WDFW. Work could be limited by the HPA to selected work windows specifying the time of year during which construction activities are allowed to occur. A temporary diversion of the streams could be needed to exclude and protect aquatic communities during construction activities.

In addition to requirements developed through ESA consultations and discussed in *Section 4.12.6, Ecosystems*, the project would develop and implement plans to minimize

impacts from construction activities and incorporate the plans into construction contracts, including:

- Turbidity Control Plan—designed to contain sediments in the nearshore areas for over-water work and for activities such as pile driving, beachhead work, and other activities below the high water level.
- Temporary Erosion and Sediment Control Plan—designed to contain and minimize sediment transport from upland construction areas. Disturbed areas would be minimized, protected from erosion, and covered during periods of inactivity that occur prior to final stabilization. Staging of grading operations would be defined and scheduled to minimize the amount of exposed soil at one time. BMPs intended to minimize sediment transport will be identified, marked on project plan sheets, and installed prior to construction activities within the general area of work. Watering may be used to control fugitive dust.
- Spill Prevention, Control, and Countermeasures Plan (as called for in *Section 4.8.7 Hazardous Materials*)—designed to reduce the potential for accidental spills, minimize their quantity, provide direction for containment, and clean up any materials that could cause pollution to the water resources and surrounding environments. Maintenance and operation requirements for equipment and vehicles would be prescribed, on-site spill response materials identified, secondary containment called out, other BMPs for spills discussed, and response, training procedures, and adaptive management processes specified.
- Dewatering Plan—designed to prevent groundwater contamination and to ensure appropriate treatment of water removed during dewatering.
- Dredge Material Management Program approval (as called for in *Section 4.8.7 Hazardous Materials*)—designed to manage the disposal of dredged sediments and minimize potential environmental impacts from dredging and disposal activities. The plan requires the approval of state and federal regulatory agencies and would identify the amount of sediment to be disposed, dredged construction techniques, transport method, and the disposal locations.
- Related water quality permits and approvals, including the terms and conditions defined by Section 401 permit issued by the U.S. Army Corps of Engineers.

In order to protect the water quality of Possession Sound, and would be further defined by the project's required water quality permits and by the terms and conditions of the Biological Opinions for the project. BMPs would be used to:

1. Use a floating containment boom surrounding all in-water work areas.
2. Schedule installation of drainage outfall work during periods of low tide to avoid inundation of excavated areas and reduce turbidity.
3. Filling holes left by removed piles with clean sand and gravel.

## **Other Alternatives**

The construction mitigation measures for the No-Build, Existing Site Improvements, and Elliot Point 1 alternatives would be similar to the measures defined for the Preferred Alternative.

## **Mitigation for Indirect and Secondary Effects**

Potential long-term contamination of Possession Sound from indirect effects would be addressed through operational and construction BMPs.

The spread of contaminated sediment or debris suspended during removal of the Tank Farm Pier would be prevented or minimized through the use of construction BMPs such as turbidity curtains, which would allow the suspended sediment or debris to settle out of the water column in a contained area.

## **Mitigation for Cumulative Impacts**

Overall cumulative impacts would be positive and would contribute to improved water quality and water resource benefits for aquatic life and human activities.

## **4.12 Ecosystems**

This section identifies, describes, and evaluates the project's long-term and short-term impacts on ecosystems (upland, wetland, freshwater, and marine wildlife habitat). The study area boundary for this evaluation is defined as a 1-mile radius from the existing ferry terminal. In addition, biologists reviewed existing information on wildlife habitats present within a 5-mile radius of the existing ferry terminal.

Sensitive wildlife, fish, plants, and their habitat can be adversely affected by project construction and operational modifications. Areas of particular concern include interference with critical life functions (foraging, migration, breeding, etc.); degradation or loss of habitat; habitat fragmentation; effects related to collisions between vehicles/vessels and wildlife; loss of animal or plant populations; impacts on food resources; water quality impacts; and direct effects from construction such as noise or other temporary disruption of habitat areas. Identifying and mitigating risks to ecosystems could prevent or reduce the effects of these impacts.

A detailed description of the affected environment and a more detailed analysis of ecosystem impacts and mitigation are presented in the *Ecosystems Discipline Report*, which is an appendix to this EIS.

### **4.12.1 Overview of Analysis and Regulatory Context**

Federal, state, and local laws protect many marine, freshwater, and upland plants, animals, and habitat from human-caused influences or impacts. Protecting habitat is necessary for the continued presence of wildlife species in urban environments, such as the city of Mukilteo. Applicable authorities protecting fish, wildlife, and their habitat include:

- **Federal:** Endangered Species Act (ESA); Migratory Bird Treaty Act; Bald and Golden Eagle Protection Act; Magnuson-Stevens Fishery Conservation Management Act (Magnuson-Stevens Act); Marine Mammal Protection Act

(MMPA); Executive Order 11990 on the protection of wetlands; Clean Water Act; Clean Air Act; and National Environmental Policy Act.

- **State:** State Environmental Policy Act; Shoreline Management Act; Hydraulic Code; Fishways, Flow and Screening Code; State Growth Management Act; Washington State Species of Concern Lists; and water quality and stormwater management regulations.
- **Local:** Cities of Mukilteo and Everett critical area regulations and Shoreline Master Programs.

## 4.12.2 Affected Environment

### Existing On-site Wetland Characteristics

Investigations performed for this project did not identify any wetlands within the project area. Palustrine (freshwater) wetlands are present in the off-site portion of the study area within Japanese Gulch and south of 5th Street, as characterized in Table 4.12-1.

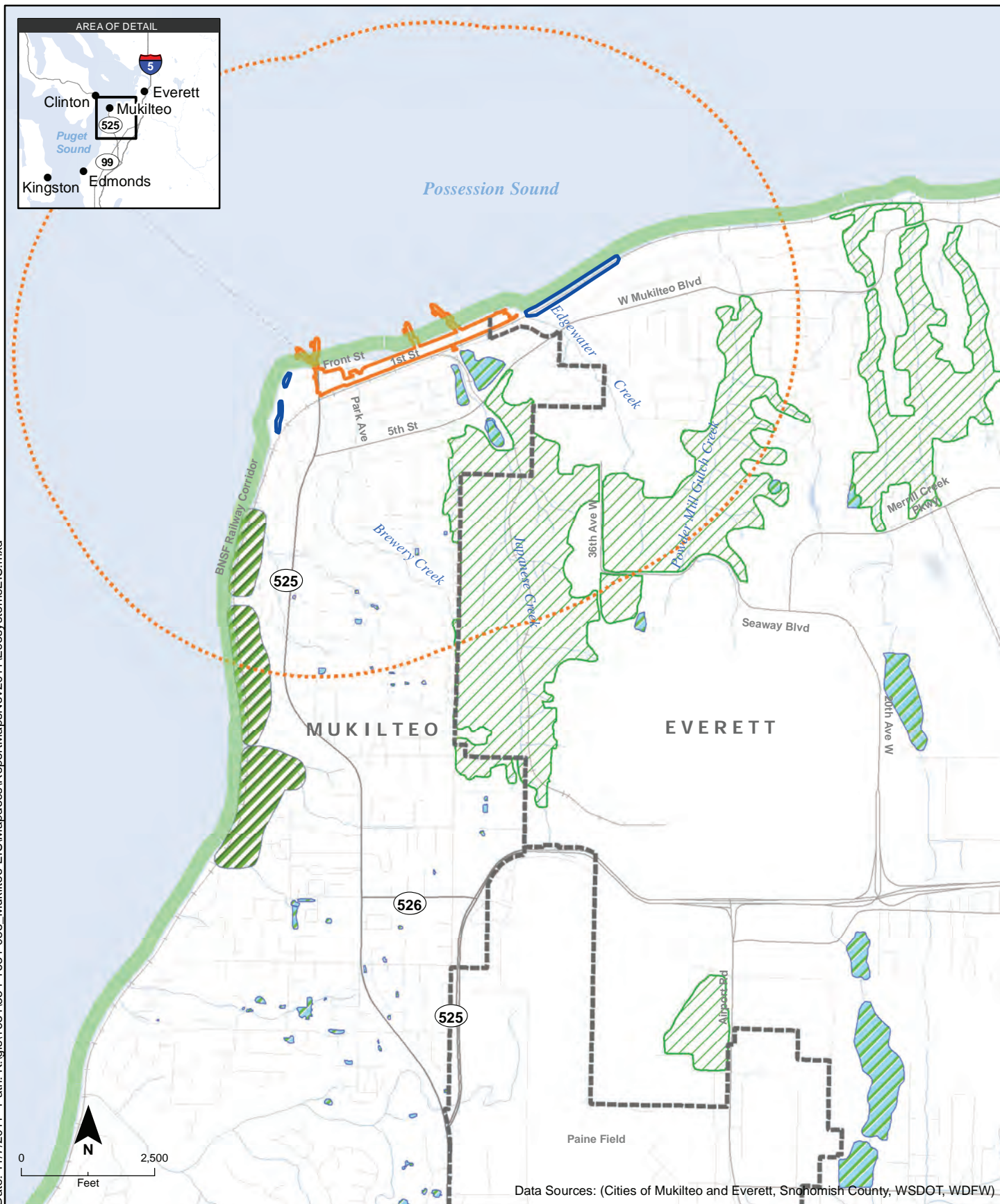
**Table 4.12-1. Study Area Wetland Habitat**

Vegetation		Wildlife
Japanese Creek Vicinity	South of 5th Street	(Throughout off-site palustrine wetland habitat)
Emergent Habitat: - reed canarygrass - creeping buttercup - rushes Scrub-Shrub Habitat: - salmonberry - Himalayan blackberry - sapling red alders Forested Habitat: - red alder - salmonberry - creeping buttercup - piggy back plant - skunk cabbage - lesser periwinkle	Forested Habitat: - red alder - salmonberry - Himalayan blackberry - reed canarygrass - piggy back plant Open Water Habitat	Observed Species: - mallard - hooded merganser - belted kingfisher - pileated woodpecker Expected Species: - raccoon - northwestern garter snake - ensatina - Pacific chorus frog - yellow warbler - common yellowthroat - goldfinch - orange-crowned warbler - violet-green swallow - tree swallow - bushtit - bufflehead - downy woodpecker

### Terrestrial Wildlife Habitat Characteristics

Terrestrial habitat (including marine nearshore habitat) in the proposed construction areas consists of urban and mixed environments. These habitats have been highly modified from their original condition and are used by animals that are adapted to human activity and disturbance. Upland forest habitat is present within 1 mile of the project area, primarily in Japanese Gulch, Brewery Gulch, and Edgewater Creek Gulch (Figure 4.12-1).

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#### Legend

- Project Area
- 1 Mile Study Area Buffer
- Backshore Restoration Projects
- City Boundary
- Marine Nearshore Habitat
- High-Quality Ecosystem
- Biodiversity Areas and Corridors
- Wetlands

Note: All habitat locations estimated.

Figure 4.12-1. **Wildlife Habitat in the Project Vicinity**

### **On-site Terrestrial Habitats**

The predominant terrestrial habitat type found in the study area is urban and mixed-use habitat. It is characterized by a high level (more than 60 percent cover) of impervious surfaces, such as pavement and buildings. Vegetation is limited to lawn and landscape strips and isolated patches of unmaintained scrub vegetation, and is dominated by non-native plants. Buildings can provide nesting opportunities for some species of birds and mammals. The species most commonly found in these areas are generally tolerant of a high level of disturbance and reproduce readily in urbanized environments. Vegetation and wildlife species likely to be found in this habitat are summarized in Table 4.12-2.

**Table 4.12-2. Study Area Urban and Mixed-use Habitat**

<b>Vegetation</b>	<b>Wildlife</b>
Non-native Species:	Observed Species:
- Himalayan blackberry	- crow
- butterfly bush	- house sparrow
- shrub roses	- Canada goose
- common St. John's wort	- European starling
- Scot's broom	- several gull species
- English plantain	- rock pigeon
- numerous grass species	- great blue heron
	- belted kingfisher
	- bald eagle
Native Species:	Expected Species:
- red alder	- song sparrow
- Douglas fir	- white-crowned sparrow
- Pacific madrone	- Bewick's wren
- red elderberry	- Brewer's blackbird
- bentgrass	- cottontail rabbit
- Canada thistle	- eastern gray squirrel
- fireweed	- house mouse
	- Norway and black rat
	- raccoon
	- Virginia opossum

Marine nearshore habitat, which extends from the high tide line along the shore to approximately 30 feet in depth, is also found within the project area. Bird species likely to be found in the marine nearshore habitat of the project area are listed in Table 4.12-3.

**Table 4.12-3. Study Area Marine Nearshore Habitat**

<b>Wildlife</b>		
Observed Marine Bird Species:	Expected Marine Bird Species:	Other Observed Bird Species:
- great blue heron	- mallard	- bald eagle
- surf scoter	- marbled murrelet	- European starling
- Barrow's goldeneye	- western grebe	- rock pigeon
- common goldeneye	- black scoter	
- common murre	- American coot	
- Canada goose	- American widgeon	
- horned grebe	- mew gull	
- red-breasted merganser	- ring-billed gull	
- double-crested cormorant	- glaucous-winged gull	
- pelagic cormorant	- killdeer	
- pigeon guillemot	- common loon	
- red-necked grebe	- long-tailed duck	
- numerous gull species	- harlequin duck	
- various waterfowl		

There are two freshwater streams, Japanese Creek and Brewery Creek, in the project area. Both Japanese Creek and Brewery Creek have been designated by Ecology as protected for salmon and trout spawning, non-core rearing, and migration; wildlife habitat; and other values. Water quality data for Japanese Creek indicate high levels of fecal coliform bacteria, lead, and turbidity. The City of Mukilteo's *Comprehensive Surface Water Management Plan* identifies water quality problems within the Brewery Creek drainage basin. These problems include untreated runoff with oil content resulting from the existing holding area for ferry traffic, and generally degraded stormwater quality as a result of the types of land use in the drainage basin. Fish have been observed in Japanese Creek, including coho salmon, cutthroat trout, and Chinook salmon, but no fish have been recorded in Brewery Creek.

### **Off-site Terrestrial Habitats**

Wildlife species found in nearby off-site habitats may be affected by construction or operation of the project. Similar to on-site areas, the off-site areas also contain marine nearshore habitat. In addition, off-site terrestrial habitats also include upland forest, grasslands, edge habitat, and palustrine (freshwater) wetlands and streams. Vegetation and wildlife likely to be found in these habitats are summarized in Table 4.12-4.

**Table 4.12-4. Study Area Off-site Habitats**

<b>Vegetation</b>	<b>Wildlife</b>
<b>Upland Forest Habitat</b>	
Japanese Gulch, Brewery Gulch, and Edgewater Creek Gulch: - red alder - black cottonwood - big-leaf maple - Douglas fir - western red cedar, - western hemlock - salmonberry - red elderberry - Himalayan blackberry - English ivy - piggy back plant High-Quality Ecosystem (southwest of project area): - big leaf maple - red alder - sword fern - fringe cup	Observed Species: - hairy woodpecker - pileated woodpecker - chestnut-backed chickadee - European starling - common crow - bald eagle Expected Species: - coyote - red fox - raccoon - Virginia opossum - common garter snake - northwest salamander - downy woodpecker - northern flicker - Bewick's wren - black-capped chickadee - Hutton's vireo - varied thrush - Wilson's warbler - red-tailed hawk - sharp-shinned hawk - winter wren
<b>Grassland Habitat</b>	
- tall fescue - reed canarygrass - other grass species - soft rush - creeping buttercup	- common garter snake - western fence lizard - European starling - savannah sparrow - song sparrow - bald eagle - great blue heron - voles - cottontail rabbit - coast mole - red-tailed hawk
<b>Edge Habitat</b>	
mix of grassland and upland forest edges	Any species noted above Additional Species: - spotted towhee - brown-headed cowbird - American robin - rufous and Anna's hummingbirds - white-crowned sparrow

Upland forest habitat in the study area is primarily located near stream corridors in Japanese Gulch, Brewery Gulch, and Edgewater Creek Gulch. These large

streamside forest areas are second or third growth and provide beneficial wildlife habitat with a diversity of plant species, two to three canopy layers, surface waters, large and small snags, downed wood, and leaf litter. These areas also provide refuge and corridors for wildlife moving through an otherwise developed landscape. As shown in Figure 4.12-1, WDFW has classified portions of the study area as biodiversity areas and corridors. These areas contain undeveloped ravines, steep hillsides, and open spaces that provide refuge for deer, coyote, raptors, and other mammals and birds.

In addition to upland forest, a portion of Japanese Gulch, located south of 5th Street, contains islands of grassland habitat. The off-site area also contains edge habitat, where the grassland and upland forest edges meet. These areas provide diversity and are typically used by a larger number of species than any one habitat.

## **Aquatic Marine Environment**

### ***Existing Physical and Chemical Conditions***

The existing physical characteristics of the shoreline in the study area have been substantially modified in ways typical of many urbanized shorelines of Puget Sound. The entire project area is armored by riprap revetment and bulkheads, through which 14 storm drains and culvert outfalls discharge into Possession Sound.

Samples that were collected from Possession Sound along the shoreline at the Mukilteo Tank Farm in 2003 showed the sediments to be generally in compliance with Ecology's sediment quality standards (WAC 173-204-320). Samples collected underneath and adjacent to the Tank Farm Pier in 2012 found levels of organochlorine pesticides and petroleum hydrocarbons slightly above regulatory criteria.

A detailed discussion of stormwater drainage in the project area and sediment and water quality in Possession Sound is presented in *Section 4.11 Water Resources*.

### ***Existing Biological Characteristics***

While shoreline modifications and human activities have reduced the diversity and abundance of species, many types of plants and animals have still been observed during project dive surveys. Nearly two dozen aquatic plant species are in the study area. Aquatic plants provide surfaces for herring to spawn, produce oxygen and take up carbon dioxide during the day, and provide juvenile fish with a refuge from predators. Aquatic plants and the small organisms that live on their surfaces also provide food for many aquatic species. Although some kelp is present in the study area, no major kelp beds (ribbon or bull kelp) occur there. The most common of the larger aquatic plants are sugar wrack, iridescent seaweed, and sea lettuce.

A survey conducted in 2005 found small patches of eelgrass west and one patch east of the Tank Farm Pier. The most recent surveys conducted in 2011 found no eelgrass throughout most of the proposed project area. Only one small clump of eelgrass (less than 1 square foot) was found just north of the Existing Site Improvements Alternative footprint.

Several invertebrate species are present in the study area. There is habitat for geoduck and hardshell clams; Dungeness crabs are also common. Geoduck surveys

showed very low numbers throughout the study area. Other invertebrates that have been commonly observed include sunflower stars and plumose anemone, and over 50 other invertebrate species, such as crabs, shrimp, barnacles, anemones, urchins, sea stars, clams, nudibranch, and octopus.

More than 40 fish species have been identified in the study area. Possession Sound is in the migratory path of several salmon species and supports many resident fish species. The most abundant fish species is surfperch. Sand lance, an important forage fish for salmonids, and several other species spawn in study area beaches.

The biological diversity in the study area is comparable to other parts of Puget Sound where development has taken place. Diversity is fairly low and the species assemblages do not represent a unique composition nor do they include any rare or uncommon species.

### **Federally and State-Listed Species and Critical Habitat**

The ESA provides for the conservation of species that are endangered or threatened with extinction and the conservation of the habitat on which they depend. Several federally and state-listed species that may be present in the study area are discussed below. The *Mukilteo Multimodal Project Biological Assessment* (WSDOT 2012) provides a detailed discussion of species that could occur in the study area and evaluates potential impacts of the proposed project (see *Appendix L*).

#### ***Endangered Species Listed Under the ESA***

**Southern Resident Killer Whales:** The Southern Resident population of killer whales predominantly feed on salmon. They have occasionally been observed in the vicinity of the Mukilteo ferry terminal, primarily between October and April. Project biologists have not observed any killer whales during site investigations. NOAA Fisheries has designated critical habitat in Washington for Southern Resident killer whales and this habitat encompasses all of Possession Sound.

**Humpback Whales:** Historically, one or two individual humpback whales have been sighted in Puget Sound in an average year. None were observed during site investigations for this project, but they are occasionally seen in the study area.

**Bocaccio:** In the Puget Sound region, the distinct population segment (DPS) of adult Georgia Basin/Puget Sound bocaccio appear to be limited to areas around Tacoma Narrows and Point Defiance. There is little information about their use of the project area. The project area has appropriate depths, steepness, and substrate complexity for adults; historically, bocaccio have been documented in the project vicinity. Critical habitat has not been proposed for bocaccio.

#### ***Threatened Species Listed Under the ESA***

**Marbled Murrelet:** Marbled murrelets are regularly seen foraging and loafing in marine waters near the existing ferry terminal and the lighthouse, although they are unlikely to nest within the project vicinity.

**Chinook Salmon:** The Chinook salmon found in Puget Sound are part of the Puget Sound evolutionarily significant unit (ESU) of Chinook salmon. They use the study area primarily for migration, foraging, and rearing. The closest river for spawning is

the Snohomish River, approximately 7 miles to the north of the study area; however, one juvenile was recently observed in Japanese Creek. Designated critical habitat for Puget Sound Chinook salmon includes the study area.

**Bull Trout:** Designated critical habitat for the Coastal-Puget Sound DPS of bull trout includes the study area, which they use for migration and foraging.

**Steelhead:** The Puget Sound DPS of steelhead trout includes steelhead from river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, Washington. The species is present in Possession Sound and likely to be found in the project vicinity. Critical habitat has not been proposed for steelhead.

**Pacific Eulachon:** Eulachon are not common in Puget Sound and there is little information about them within the project area. The Puyallup River is the only Puget Sound system in which eulachon are known to spawn; spawning regularity in that river is classified as rare. The species was not observed during dive surveys, and is unlikely to occur in the project area. NOAA Fisheries has proposed critical habitat for the southern DPS of Pacific eulachon but that proposal does not include Puget Sound.

**Canary Rockfish:** Canary rockfish have historically been observed in the study area. The project area has none of the rocky reef habitat favored by adult rockfish. Juvenile rockfish are associated with kelp beds and other macroalgae, which are limited in the project area. Critical habitat has not been proposed for canary rockfish.

**Yelloweye Rockfish:** Yelloweye rockfish have historically been observed in Possession Sound; however, little is known about their presence in the study area. The project area has none of the rocky reef habitat favored by adult rockfish. Juvenile rockfish are associated with kelp beds and other macroalgae, which are limited in the project area. Critical habitat has not been proposed for yelloweye rockfish.

**Steller Sea Lion:** No Steller sea lion haul-outs (habitat sites on land or ice) are located on the project site or in the vicinity of the proposed project. Steller sea lions have been observed playing in the propeller wash of the ferry at the Edmonds Ferry Terminal. Steller sea lions may be present in the project vicinity, but none were observed during site investigations.

### ***Federal Species of Concern***

Coho salmon is a federal species of concern under the ESA that is found in the study area. While species of concern receive no protections under the ESA, coho salmon are covered by the Magnuson-Stevens Act, which requires consultation with NOAA Fisheries concerning potential effects to their habitat (see *Essential Fish Habitat* below). Coho have been documented to use the lower reach of Japanese Creek upstream of the culverts, south of the Mukilteo Tank Farm. Habitat requirements, construction windows, and life histories are similar to federally listed salmonids.

### **State Species of Concern**

Washington State maintains a Species of Concern list for many species native to Washington that are in various states of decline. State-listed species that occur or may occur in the study area are:

- **Endangered:** Southern Resident killer whales and the humpback whale
- **Threatened:** Marbled murrelet and Steller sea lion
- **Candidate:** Pacific harbor porpoise, Chinook salmon, bull trout, canary rockfish, yelloweye rockfish, bocaccio rockfish, Clark's grebe, Western grebe, and common murre
- **Sensitive:** Bald eagle, common loon, and gray whale
- **Monitored:** Harbor seal, Dall's porpoise, red-necked grebe, great blue heron, green heron, and Caspian tern
- **Priority habitat:** Priority habitat for Dungeness crab and Pacific sand lance also occurs in the project vicinity. Sand lance spawning has been documented on a small (200 feet) section of beach near the Silver Cloud Inn property approximately 300 feet east of the existing terminal, but would not be affected by any of the alternatives. Impacts on Dungeness crabs are discussed in *Section 4.12.3*.

### **Other Marine Mammal Species**

Several non-listed marine mammal species have also been observed in the project area. Transient orca whales have been documented in the project vicinity. California sea lions are common in Puget Sound and frequently observed in the project area. Elephant seals and minke whales are less common, but may be seen in the project area. Like all marine mammals, these species are protected under the MMPA, regardless of their abundance.

### **Essential Fish Habitat**

The Magnuson-Stevens Act establishes requirements for essential fish habitat (EFH) descriptions in federal fishery management plans and requires federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH. The Pacific Fishery Management Council (PFMC) has designated EFH for Pacific salmon, Pacific coast groundfish, and coastal pelagic species. EFH for all three groups is found in the study area. A detailed discussion of EFH species that could occur in the study area and potential impacts of the proposed project is included in the *Biological Assessment* (*Appendix L*).

### **Commercial, Recreational, and Tribal Fisheries**

The proposed project is entirely within WDFW Fishery Management Area 8-2, which includes a number of tribal, commercial, and recreational fisheries. Several tribes have federally recognized treaty rights within the study area to take fish and shellfish at all usual and accustomed fishing grounds and stations. Tribal harvest focuses on salmon and Dungeness crab. Non-tribal commercial gill netting for salmon is limited by

WDFW in this area. Tribal, commercial, and recreational crab fishing occurs in the study area. The most consistent marine harvest activities in the vicinity of the study area are littleneck clams, butter clams, and horse clams. Ghost shrimp are harvested year-round for use as bait. An extensive geoduck survey conducted in 2005 found geoduck densities in the commercial harvest to be extremely low.

### 4.12.3 Long-Term Environmental Impacts

#### All Alternatives

##### Over-water Structures

Each of the proposed alternatives would change the amount of over-water cover due to replacement or construction of wingwalls, dolphins, transfer spans, and passenger and maintenance facilities, as well as demolition of the existing trestle. The Preferred Alternative and the Elliot Point 1 Alternative would also remove the Tank Farm Pier and approximately 3,900 associated piles (7,300 tons of creosote-treated timbers). Table 4.12-5 provides estimates of the approximate changes in over-water cover for the alternatives.

**Table 4.12-5. Over-Water Cover Estimates for Each Alternative (square feet)**

Alternative	Removal of Existing Over-Water Cover	Creation of Over-Water Cover	Net Change
No-Build	10,200	13,200	3,000
Preferred	150,200	21,100	-129,100
Existing Site Improvements <sup>1</sup>	12,100	24,100	12,000
Elliot Point 1	150,200	33,900	-116,300

<sup>1</sup> Estimate does not include the replacement of the Port of Everett fishing pier and seasonal day moorage facility. Depending on the location and design, 1,500 to 5,000 square feet of over-water cover could be added.

Direct over-water cover reduces sunlight available to macroalgae, which can reduce or eliminate macroalgae populations in an area. Epibenthos are all organisms that live on or just below the surface of the seabed. Those that occur in the immediate footprint of the new trestles would likely be affected, and epibenthic production within about 20 feet of the terminal for any of the alternatives would be affected by shading. Eelgrass is unlikely to be affected due to its location in the study area. The No-Build Alternative would have the least impact on epibenthos because the project would replace existing structures in the same location. Elliot Point 1 Alternative would have the largest amount of new over-water cover due to the size of over-water structures associated with the new terminal; however, this option would also remove over-water cover from the existing terminal facility and the Tank Farm Pier that would provide a net improvement.

Juvenile salmonids depend on nearshore habitats for food and refuge. Over-water structures, such as ferry terminals, bridges, docks, piers, and temporary work trestles, may directly affect juvenile salmon, especially Chinook and chum, by disrupting migratory behavior along the shallow-water nearshore zone. Delays in migration

could lead to increased energy expenditure. The widths of the over-water structures associated with the No-Build Alternative, Preferred Alternative, and Existing Site Improvements Alternative are all similar. The Elliot Point 1 Alternative would have the largest over-water footprint and could have a greater impact on juvenile salmonid migration. Also, some studies have suggested that migrating salmonids may not pass under an over-water structure, but instead be pushed farther offshore where they may become more susceptible to predation from birds, mammals, and other fish. However, a study performed at the Mukilteo ferry terminal in 2002 did not find any evidence of increased predation due to over-water cover at the site.

### ***Habitat Displacement by New Piles and Dolphin Anchor System***

The No-Build and Existing Site Improvements alternatives would each install approximately 20 new piles. The Preferred Alternative would install approximately 110 new piles. The Elliot Point 1 Alternative would install slightly more piles than the Preferred Alternative. New piles and dolphin anchor chain movement would permanently displace bottom (benthic) habitats and eliminate benthic plants and animals, including macroalgae, clams, worms, anemones, and urchins, in the footprint of the new piles and dolphin anchors. Eventually, the new piles associated with the alternatives would become new habitat for a variety of species. All of the alternatives would replace or remove the existing terminal, eliminating about 250 creosote-treated piles that support the timber trestle and transfer span. Benthic communities would likely develop at these locations and vertical pile communities would likely develop on new piles, helping to offset the communities lost during pile removal. The *Mukilteo Multimodal Project Biological Assessment* (WSDOT 2012) contains more information about the impacts to benthic habitat.

### ***Effects from Propeller Scour***

Ferry propellers create currents that can disturb bottom sediments, resulting in the creation of scour holes that displace benthic organisms and reduce available habitat. Propeller wash modeling conducted for each of the four alternatives showed that scour holes would potentially form as follows:

- No-Build Alternative: Scour hole of approximately 2.9 feet at a depth of 20 to 25 feet below MLLW
- Preferred Alternative: Scour hole of about 1.4 feet at a depth of 20 to 25 feet below MLLW
- Existing Site Improvements Alternative: Scour hole of about 4.5 feet at a depth of 15 to 20 feet below MLLW
- Elliot Point 1 Alternative: Scour hole of about 4.5 feet at a depth of 15 to 20 feet below MLLW

Bottom scour would stabilize after a few months; however, it could be minimized by placing coarser sediment on the bottom that would resist movement.

**Beneficial Effects**

Each of the proposed alternatives would remove about 290 creosote-treated piles and decking of the existing terminal. The creosote material may be seeping into the water and sediment, and removing the piles is the only way to eliminate this impact.

**All Build Alternatives****Impacts on Marine Nearshore Habitat**

Some marine nearshore habitat would also be lost under the Build alternatives due to the new ferry slip configurations. Wildlife use of this habitat by species such as Barrow's goldeneye, horned grebe, surf scoter, American coot, double-crested cormorant, pigeon guillemot, mew gull, ring-billed gull, common loon, and glaucous-winged gull could shift to the areas where the existing ferry slip is removed and to adjacent marine nearshore habitats to the east and west.

**Beneficial Effects**

All three Build alternatives would provide enhanced stormwater treatment to remove pollutants from runoff from the project's parking lots and bus terminals. This treatment would improve habitat by minimizing pollutant loads to receiving waterbodies. More information on stormwater management and treatment is presented in *Section 4.11 Water Resources*.

**Preferred Alternative****Terrestrial Habitat**

The Preferred Alternative would develop a portion of the Mukilteo Tank Farm and new landscaping would replace sparse herbaceous and scrub vegetation. Thus, the area would remain as urban and mixed use habitat, but the level of human activity on the site would increase. Wildlife use of this habitat for nesting, foraging, and perching would be reduced and/or displaced. However, reduction of habitat would be minor and temporary because species found in this habitat type are accustomed to human disturbance; moreover, the developed property would also provide some wildlife habitat.

**Impacts on Crab and Crab Habitat**

Dungeness crab abundance is relatively high east of the Tank Farm Pier and gravid female crabs use the sediment berm during the winter. This is in the area where the Preferred Alternative would be located. Removal of the Tank Farm Pier, which would remove feeding habitat as well as change the sea bed in elevations and sediment composition in the area, could reduce crab use in the area. Dredging would occur across a portion of the footprint of the Tank Farm Pier and could also reduce crab use in the area. While pier removal would not affect overall Dungeness crab populations, it would likely reduce the numbers of crabs in the project area.

### ***Erosion of the Sediment Mound underneath the Tank Farm Pier***

Over time, a mound of sediment several feet higher than the surrounding seabed has developed in the slow-moving waters beneath the Tank Farm Pier. Removal of the pier would cause a measureable change in wave energy that could, in some circumstances, move sediment from this mound up to 1800 feet down current. The erosion rate would be slow and would only occur during larger (5- to 10-year) storms.

Approximately 1,050 cubic yards of material would eventually be eroded from the sediment mound. Even if all the material were to be mobilized at once and deposited within 2,000 feet of the pier, it would form a layer only 0.08 inch thick. Movement of sediment from the mound would therefore not pose a significant risk of smothering aquatic plants or macroinvertebrates in the project vicinity.

Sediment sampling underneath the Tank Farm Pier revealed low levels of organochlorine pesticides and petroleum hydrocarbons at various layers, but some samples did exceed regulated limits. Transport of sediments could spread contaminated material detrimental to aquatic organisms; however, the amount of material that would be transported would not pose a risk. *Section 4.8 Hazardous Materials* contains additional discussion of these sediments.

### ***Beneficial Effects***

In addition to removing approximately 290 creosote-treated piles and decking of the existing ferry terminal, the Preferred Alternative would demolish the Tank Farm Pier and remove approximately 3,900 creosote-treated timber piles associated with the pier. This would eliminate approximately 7,300 tons of creosote-treated timbers from the environment and create a net gain of approximately 2,870 square feet of benthic habitat. Also, sediments beneath the Tank Farm Pier would undergo additional testing prior to construction. Dredged sediments that do not meet regulated criteria would be disposed of at appropriate upland locations, reducing the amount of contaminated sediments in the aquatic environment. Removing the Tank Farm Pier would also eliminate the shade from approximately 138,100 square feet of over-water structures. This would allow more sunlight that would potentially increase macroalgae and eelgrass growth, increase macroinvertebrate production, and improve habitat for salmonids and other fish. Pile removal would occur over an area of approximately 150,200 square feet, which includes 138,100 square feet for the Tank Farm Pier, 2,000 square feet for the existing trestle, and 10,100 square feet for the fishing pier. The *Biological Assessment (Appendix L)* provides additional information about biological resources and the Preferred Alternative's beneficial effects.

### ***Elliot Point 1 Alternative***

The Elliot Point 1 Alternative would have similar impacts to those of the Preferred Alternative regarding terrestrial habitat, crabs and crustaceans, erosion of sediment beneath the Tank Farm Pier, and aquatic habitat benefits. Also, under the Elliot Point 1 Alternative, a portion of Japanese Creek within the project footprint would be restored to an open stream with a 50-foot vegetated buffer on each side. The

vegetated buffer would provide nesting and foraging habitat for wildlife and an open stream channel would also improve habitat for fish species that use the creek.

## **4.12.4 Construction Impacts**

### **All Alternatives**

Construction impacts are common to all alternatives and include disturbance from construction activities, grading and staging, impaired water quality, and effects on aquatic species from underwater noise related to pile driving.

#### ***Disturbance, Grading, and Staging***

Under all alternatives, construction would occur in both the urban and mixed-use habitat and the marine nearshore habitat. The wildlife that currently use these habitats could be reduced and/or displaced during construction as a result of increased traffic, human activity, and noise. However, because the upland area is already developed with residential and commercial uses, effects on wildlife using the urban and mixed environments would be minimal.

In the marine nearshore environment, marine bird species would be affected by construction activity and underwater noise associated with pile driving. The existing underwater noise level is dominated by noise generated from human activities, primarily marine vessel traffic (additional discussion of underwater noise is presented below).

Temporary impacts on non-aquatic vegetation may result from grading, staging, and other project-related activities. No impacts on protected non-aquatic plant species are expected because none are known to occur within the study area.

#### ***Water Quality***

Construction activities such as pile driving and removal, construction of stone columns, dredging, and placement of anchoring systems could create turbidity and result in temporary impacts on fish and aquatic resources from decreased water quality. The extent and duration of in-water work of each alternative and the specific construction methods and materials would affect the magnitude of the temporary impacts.

Impacts on aquatic resources due to elevated turbidity include:

- Mortality, gill tissue damage, and physiological stress to fish, including juvenile salmonids
- Burial, abrasion of body parts, and clogging of filtration systems of crustaceans and other marine invertebrates
- Reduced light levels affecting behavior and feeding of aquatic animal species
- Reduced photosynthesis by burial of aquatic plants or reduced light levels
- Behavioral changes

Piles would be removed under each alternative, suspending sediment, and temporarily increasing turbidity in the surrounding area. The sediments suspended could also be contaminated by creosote. Factors affecting the amount of turbidity generated during

pile removal include the type and number of piles removed, the removal technique used, and the characteristics of the bottom sediments. Pile installation also can generate turbidity. However, turbidity is less of an issue with pile installation because the impact is highly localized.

Based on modeling conducted for the project, increases in turbidity resulting from pile removal, pile installation, dredging, and the installation of stone columns would be localized and temporary, and would not exceed water quality standards. These activities are also a one-time disturbance, and benthic organisms are expected to rapidly recolonize altered areas after construction.

*Section 4.11 Water Resources* contains more discussion about construction-related water quality impacts.

### **Underwater Noise**

Pile driving produces intense sound pressure waves in the water column that can adversely affect fish, marine mammals, and other aquatic species. The level of sound produced during pile driving depends on several variables including the type of hammer used, the type and size of piles being used, and the characteristics of the substrate. The distance that the sound travels under water and in air also depends on several variables, including topography.

High levels of underwater sound can injure and kill fish. Fish with swim bladders, such as salmonids, are more susceptible to barotraumas (injuries, such as hemorrhage and rupture of internal organs, caused by pressure waves) from impulsive sounds, like impact pile driving. Death from barotrauma can be instantaneous or delayed up to several days after exposure.

Elevated noise levels can also cause sublethal injuries, such as a reduced ability to detect predators and prey, or hearing damage. Also, sound may affect behavior, resulting in fish avoiding foraging or spawning grounds. The impact of these avoidance responses may be lasting if feeding or reproduction is impeded.

For marine mammals, whales in particular, sound is one of the most critical sensory pathways of information. Noise impairs communication, detection of prey, and navigation. It also causes harmful physiological conditions, energetic expenditures, reduced hearing sensitivity, behavioral changes, and changes in cardiac rates and respiratory patterns. Changes in behavior can range from minor changes in orientation or breathing to interrupted feeding or avoidance of an area. Very loud noises at close range may cause hearing damage, other physical damage, or even death.

Diving birds may also be harmed by noise levels in the range of those that harm fish and mammals, and they may experience similar effects such as a reduced ability to detect predators or prey, or to forage. Mitigation measures and monitoring will reduce impacts to diving birds and other marine mammals.

### **No-Build Alternative**

The No-Build Alternative would install approximately 20 new piles, which is the fewest among the proposed alternatives. This would potentially result in the least impact from turbidity and underwater noise.

## **Preferred Alternative**

The Preferred Alternative would install approximately 110 new piles for the terminal facilities and relocated fishing pier. It would remove the existing terminal facility and the Tank Farm Pier, and dredge a navigation channel about 500 feet wide by 100 feet long through a sediment mound beneath the pier. The channel would provide navigation depth of -28 feet at an average lowest tide, which would require dredging to a depth of -30 feet. Approximately 19,500 cubic yards of material would be dredged for the channel.

Pier removal and dredging would likely mobilize sediments under the pier that have been found to contain low levels of organochlorine pesticide and petroleum hydrocarbon contamination. Pile removal would also generate turbidity, as would dredging.

The foundation of the new pier structure for the Preferred Alternative would utilize stone columns. Stone columns are constructed with a vibratory probe that feeds crushed gravel or quarry spall into potentially liquefiable soils to create a solid foundation. Construction of the columns could resuspend sediments and temporarily generate turbidity within the vicinity of the installation area. The installation of stone columns will affect about 1,414 square feet within an area of about 25,000 square feet. The affected area would still provide habitat after construction, though the surface substrate may be more gravelly than prior to stone column installation.

## **Existing Site Improvements Alternative**

Similar to the No-Build Alternative, the Existing Site Improvements Alternative would also install approximately 20 new piles, the fewest among the proposed Build alternatives.

## **Elliot Point 1 Alternative**

Construction impacts from the Elliot Point 1 Alternative would be similar to those described above for the Preferred Alternative. The Elliot Point 1 Alternative would drive somewhat more piles than the Preferred, No-Build, and Existing Site Improvements alternatives. As noted with the other alternatives, pile driving creates the potential for turbidity and underwater noise impacts to aquatic species.

### **4.12.5 Cumulative Impacts**

The population of Puget Sound has increased from approximately 1.29 million people in 1950 to 4.22 million in 2005; by 2025 the population is expected to reach 5.36 million. The population of Snohomish County has increased an average of 3 percent per year since 1960, from 172,199 to 711,100 inhabitants. The city of Mukilteo has even higher growth rates and has expanded from a population of 775 at its incorporation in 1947 to 20,254 today. This trend is likely to continue for the foreseeable future; 2030 population projections for Snohomish County range from 790,930 to 1,109,202.

Population growth and resource use have contributed to environmental impacts in the region. Historically, the project area landscape was dominated by western lowland mixed conifer and hardwood forest. During European settlement of the

region, farming and logging changed the landscape, reducing forest cover and replacing many native species with introduced species. In recent times continuing habitat conversion for urban and industrial development has led to further habitat fragmentation and filling of wetlands.

Aquatic habitat has also been reduced and degraded due to development since the area was settled by Europeans. Approximately one-third of the Puget Sound shoreline has been modified by seawalls, docks, and other structures. Riprap, bulkheads, docks, and other structures line the entire shoreline in the study area. Water pollution is another threat to aquatic ecosystems; urban runoff contributes to non-point source pollution by degrading water quality and threatening aquatic species. Between 2002 and 2006 the number of marine species of concern in the Salish Sea ecosystem (extending from Canada to Puget Sound) increased from 60 to 64. Green sturgeon, Pacific eulachon, Southern Resident killer whales, and several species of salmonids and rockfish have been recently listed as threatened or endangered under the ESA.

Other projects within the study area could contribute to environmental impacts. In general, the Mukilteo Multimodal Project could result in improved water quality by providing stormwater treatment, removing creosote-treated piles, and remediating contaminated sediments. The project could also provide habitat restoration by removing over-water structures and daylighting Japanese Creek if the Elliot Point 1 Alternative were constructed. However, development of shoreline properties could reduce some urban mixed and marine nearshore habitat as well as increase over-water cover; known development activities are described below.

### **Mukilteo Tank Farm Transfer, U.S. Air Force**

The change of ownership for the Mukilteo Tank Farm is not likely to contribute to higher cumulative impacts on ecosystems compared to conditions today. The transfer itself is generally “as is” with no further improvements, although the transaction includes covenants to maintain some environmental protections and address issues related to past practices on the site.

### **Mukilteo Tank Farm Master Plan, Port of Everett**

If all or parts of the Mukilteo Tank Farm were developed with other uses, development would need to meet current permitting standards, which would include shoreline setbacks, open space requirements, and upgrades of stormwater systems. Redevelopment to current standards would provide environmental benefits. However, redevelopment would also result in increased traffic, human activity, and noise. A full replacement of all facilities on the site would remove the urban and mixed-use habitat used by wildlife, but open space features and landscaping would provide long-term replacement habitat.

### **Sounder Mukilteo Station, Sound Transit**

Further development of the Sounder Mukilteo Station is not likely to contribute to increased cumulative impacts on ecosystems because the property is already developed and provides little habitat. The remaining improvements are largely within the existing footprint.

## **NOAA Mukilteo Research Station Expansion**

Expansion of the NOAA Mukilteo Research Station could result in minor impacts on urban mixed and marine nearshore environments, depending on the facility design.

## **Mount Baker Terminal, Port of Everett**

Construction of the Mount Baker Terminal created additional over-water cover along the shoreline. To offset potential impacts from shading, the Port planted eelgrass shoots west of the terminal. A permanent access roadway is still needed for the terminal, which could encourage development of parts of the Mukilteo Tank Farm, but also could trigger City of Mukilteo permit conditions to include more open spaces with ecosystem benefits.

## **Restoration of Japanese Creek**

The City of Mukilteo plans to restore a section of Japanese Creek to its previous channel. In addition, the City plans to add weirs to a section of the creek to allow fish access to an adjacent wetland, which would increase rearing and foraging habitat. The City also plans to daylight the creek along the Possession Sound shoreline, which would restore riparian and aquatic habitat. The Elliot Point 1 Alternative includes this action as part of the alternative, so it would not have a cumulative impact. However, the Preferred Alternative and other alternatives would not affect the areas above the culvert. Daylighting Japanese Creek and other creek restoration activities would increase riparian and aquatic habitat.

## **Mukilteo Lighthouse Park**

Shoreline restoration efforts for this project have improved nearshore habitat within the park. A proposed pedestrian pier would create a small amount of over-water cover. A potential relocation of the park's boat launch to the Mukilteo Tank Farm would return the existing boat launch shoreline area to a more natural state, but could affect shoreline habitat at the new location depending on the conditions at the new site.

## **4.12.6 Mitigation Measures**

### **Mitigation for Long-Term Impacts**

#### ***Preferred Alternative***

The Preferred Alternative incorporates ecosystem protection and enhancement measures in its definition because it would remove creosote piles and over-water coverage at the existing terminal site and at the Mukilteo Tank Farm, which would help offset the impacts of new or replacement structures.

Landscaping elements in the proposed project would compensate for some of the lost urban and mixed-use habitats. Loss of marine nearshore habitat would be offset by removal of the existing terminal and Tank Farm Pier.

Mitigation measures that would help avoid or minimize potential impacts on fish, marine mammals, and other aquatic species include:

- Collecting and conveying stormwater generated by the over-water coverage of the dock to onshore water quality treatment facilities to avoid the potential for water quality impacts in Possession Sound
- Using concrete or steel piles where possible, which would likely be replaced less frequently
- Incorporating grating and/or lights under the pier in the terminal design, where feasible, to minimize the effects of shading on fish species migrating along the shoreline

The project would also comply with the terms and conditions developed through consultation with NOAA Fisheries and the U.S. Fish and Wildlife Service in compliance with the ESA, the Magnuson-Stevens Act, and MMPA, which would be documented in the services' Biological Opinions and other permits, and included in the project's Record of Decision by FTA. The project would also meet the permit requirements of local, state, and federal agencies with jurisdiction over aquatic lands and shoreline areas; these permits include commonly applied mitigation measures or BMPs as well as project-specific mitigation requirements.

Removal of the existing terminal facility and the Tank Farm Pier would help to mitigate the increase in overwater structures, resulting in a net reduction of over-water cover of 3.0 acres. Demolition of the pier would also remove approximately 3,900 creosote-treated piles from the marine environment, likely improving water quality in the long term. Removal of the Tank Farm Pier has the potential to mobilize any contaminated sediments underneath the pier. As part of the project's design and permitting processes, the newly exposed sediment surface will be further characterized to determine if contaminated sediments are present at depths that would be exposed after dredging. WSDOT will consult with the permitting agencies to determine if a cap or other measures are needed to reduce the potential for erosion and transport of contaminated sediment. The detailed measures and the data requirements necessary to define the measures will be guided by the permitting process and its requirements.

Mitigation for hazardous materials, as defined in *Section 4.8, Hazardous Materials*, includes measures to clean up or contain contamination encountered during project construction.

### **No-Build Alternative**

The No-Build Alternative would replace existing over-water structures and could increase over-water coverage. The increase in over-water coverage may require compensatory mitigation for any lost ecosystem function and values. Compensatory mitigation could include funding for the removal of other over-water structures no longer in use or other habitat restoration measures. The exact type of mitigation would be determined in consultation with WDFW, DNR, and other regulatory agencies during project permitting.

### **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative would require mitigation similar to that described for the No-Build Alternative.

### ***Elliot Point 1 Alternative***

Similar to the Preferred Alternative, the Elliot Point 1 Alternative would mitigate the increase of over-water structures by removing the Tank Farm Pier. The Elliot Point 1 Alternative would result in a net reduction of 2.6 acres of over-water cover.

## **Mitigation for Construction Impacts**

### ***Preferred Alternative***

Mitigation for construction impacts would include BMPs, conservation measures, and avoidance and minimization measures that are outlined below and would be further defined through the consultation and permitting process required for the project. Construction BMPs would be implemented to avoid or minimize impacts on ecosystem resources from construction activities. The *Mukilteo Multimodal Project Biological Assessment* (WSDOT 2012) provides more details about many of the projects proposed BMPs and standards. Construction activities would comply with the terms and conditions developed through consultation with NOAA Fisheries and the U.S. Fish and Wildlife Service in compliance with the ESA, the Magnuson-Stevens Act, and MMPA, and through all other permits required for the project.

Noise impacts would be minimized by construction planning and scheduling of in-water work to avoid critical periods in the life cycles of protected species and their habitats; monitoring for marine mammal and bird presence before and during construction; using installation techniques such as vibratory hammers instead of impact pile driving to reduce noise generation whenever possible; conducting pile driving during low tides using wood pile caps with concrete piles when feasible; monitoring ongoing compliance with permit terms and conditions during construction; and using lower level warning sounds and ramping up noise to warn wildlife of pending noise increases.

Impacts on migratory birds would be addressed by timing vegetation and structure removal appropriately, removing noxious weeds, and revegetating those areas and other disturbed areas with native species.

In addition to the terms and conditions defined through ESA consultations, additional measures to minimize general construction impacts include:

- Developing and implementing an approved Construction Stormwater Pollution Prevention Plan, which would serve as the overall stormwater mitigation plan and would include each of the following plans: Temporary Erosion and Sediment Control Plan; Spill Prevention, Control, and Countermeasures Plan; Concrete Containment and Disposal Plan; and Fugitive Dust Plan.
- Selecting construction equipment and techniques to minimize surface impacts, noise, and disturbance to or transport of bottom sediments. WSDOT will consult with the permitting agencies to determine if a cap or other measures are needed to reduce the potential for erosion and transport of contaminated sediment at the Tank Farm Pier site.
- Selecting and implementing BMPs to properly prevent pollutants from entering the water due to construction activities or pile removal.

- Adhering to the conditions specified in dredging and sediment disposal permits, NPDES permits and related construction and water quality permits.
- Using adaptive management strategies if problems are identified.

Other mitigation measures that could avoid or minimize impacts on ecosystems are discussed in *Section 4.3 Noise and Vibration*, *Section 4.7 Air Quality*, *Section 4.8 Hazardous Materials*, and *Section 4.11 Water Resources*.

### **Other Alternatives**

The No-Build Alternative, the Existing Site Improvements Alternative and the Elliot Point 1 Alternative would have similar construction mitigation measures as the Preferred Alternative, except for measures related to the treatment of hazardous materials or the Tank Farm Pier, which only the Elliot Point 1 Alternative would also feature.

### **Mitigation for Cumulative Impacts**

The development of the Mukilteo Tank Farm may result in the loss of urban and mixed environments and marine nearshore habitat. Appropriately designed landscaping or open space elements in the proposed project vicinity would compensate for some of the lost urban and mixed-use habitats. Compliance with existing federal, state, and local regulations would also reduce environmental impacts.

## **4.13 Public Services and Utilities**

This section evaluates the project's potential to affect public services and utilities within a study area that includes the SR 525 corridor to the ferry terminal and the areas within 0.5 mile of the alternatives.

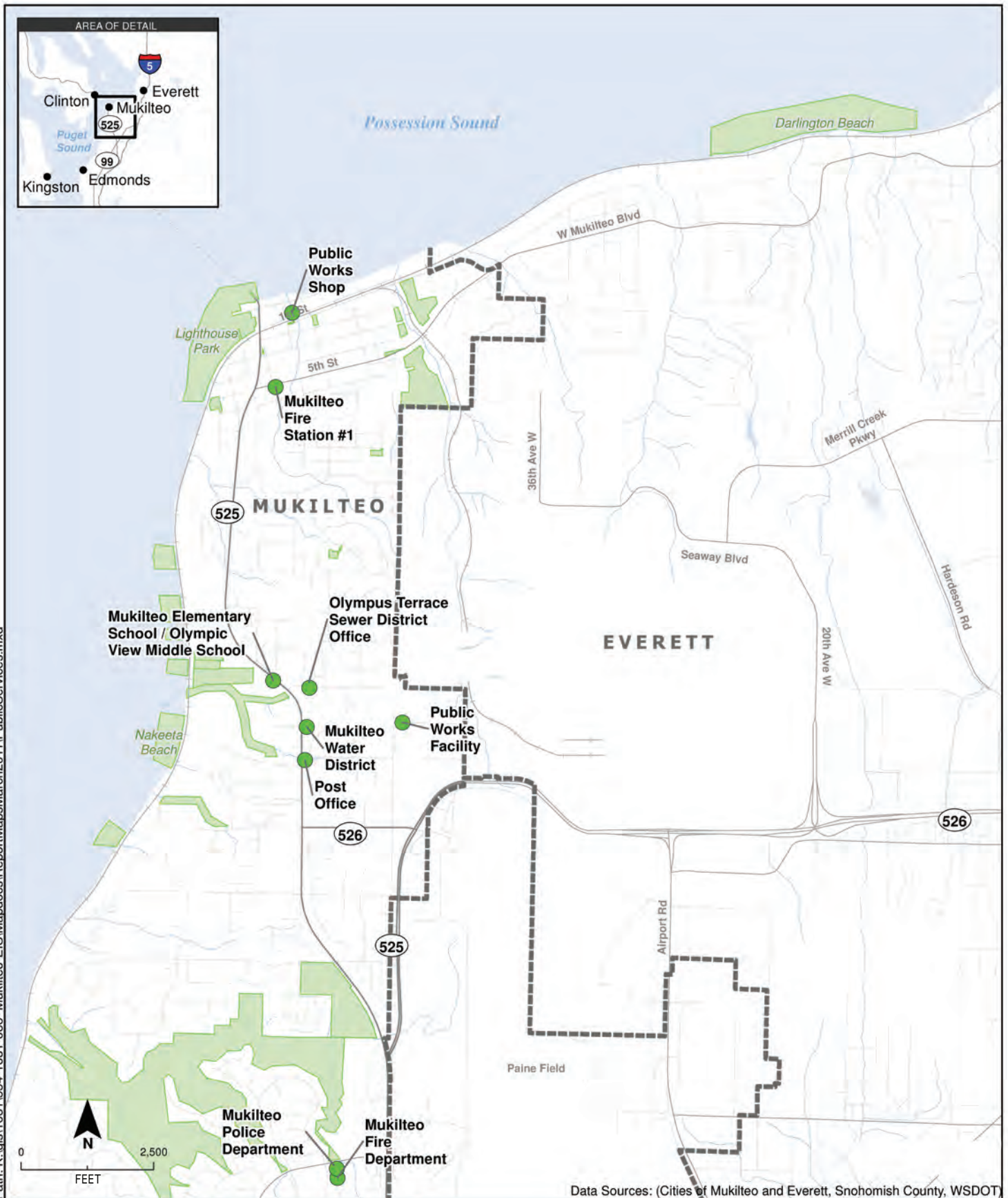
### **4.13.1 Overview of Analysis and Regulatory Context**

#### **Regulatory Context**

Public services and utilities are areas of analysis required under NEPA and SEPA. Factors to be considered include direct changes to physical facilities or the operations of public service providers, and potential changes in the demand for or quality of the public services and utilities. The study area, roughly the northern half of the city of Mukilteo and a small portion of the city of Everett, includes the service areas of several public service providers in the project area.

#### **4.13.2 Affected Environment**

Public services and facilities in the study area include police, fire, and emergency medical response, public schools, and solid waste collection. Public service facilities located in the study area are shown in Figure 4.13-1. This includes the City of Mukilteo's public works buildings and shops, as well as the facilities identified below.



- Public Services
- Parks and Recreational Facilities
- City Boundary

Figure 4.13-1. **Public Services**

### ***Police, Fire, and Emergency Medical Services***

The Washington State Patrol and the City of Mukilteo Police Department provide police and patrol services in the study area. State Patrol officers provide traffic control along SR 525 and security at the existing ferry terminal.

The City of Mukilteo Fire Department provides fire suppression, rescue, and emergency medical services in the study area. As part of a county-wide mutual aid agreement coordinated through Snohomish County Emergency Management Services, adjacent jurisdictions provide backup emergency response to the study area.

### ***Schools***

The Mukilteo School District serves about 14,000 students living in Mukilteo and south Everett. Two schools are in the study area, Mukilteo Elementary School and Olympic View Middle School, both about 1.5 miles south of the proposed ferry terminal sites.

### ***Solid Waste and Utilities***

Solid waste and refuse service is provided by Waste Management NW. Water, sewer, electric power, natural gas, telephone, and cable telecommunications providers include the Mukilteo Water and Wastewater District, the Snohomish County Public Utility District No. 1 (SnoPUD), Puget Sound Energy (PSE), Verizon, and Comcast.

## **4.13.3 Long-Term Environmental Impacts**

### **No-Build Alternative**

The No-Build Alternative would not generate additional demand for most public services. It would, however, result in increased traffic congestion along SR 525 and in Mukilteo's downtown and waterfront areas. As a result, additional demand would be placed on the Washington State Patrol to manage traffic. These traffic delays and congestion could result in longer response times for emergency service providers and would also make access to and from schools, community facilities, and activities in the study area more difficult.

No long-term impacts on utilities would occur.

### **Preferred Alternative**

The Preferred Alternative is not expected to generate additional demand for public services. Reductions in queue length and the elimination of existing congestion and safety points would improve access and response times for public service providers. The significant reduction in queuing on SR 525 could reduce the need for Washington State Patrol traffic control on SR 525 compared to the No-Build Alternative.

No long-term impacts on utilities are expected. The new facility is not anticipated to substantially increase the overall demand for services from utility providers, but it will connect to those utilities.

## **Existing Site Improvements Alternative**

The Existing Site Improvements Alternative would not generate additional demand for public services. The alternative would include some improvements in access and traffic circulation along SR 525 and in the downtown and waterfront areas.

Compared to the No-Build Alternative, the project could improve transportation access and circulation in the study area, and safety concerns related to sight distance would be reduced. Queuing and congestion problems would still remain. Overall, compared to the No-Build Alternative, emergency service provision and access to public facilities would be similar or better and demand for the Washington State Patrol to provide traffic management could be reduced, compared to No-Build conditions.

No long-term impacts on utilities are expected to result.

## **Elliot Point 1 Alternative**

The potential long-term impacts of this alternative are similar to those described above for the Preferred Alternative.

### **4.13.4 Construction Impacts**

#### **No-Build Alternative**

Traffic congestion resulting from construction activities could affect response times for emergency service providers. This could occur not only in Mukilteo, but also in Edmonds during periods when the terminal is completely closed and ferry traffic is redirected to Edmonds.

The No-Build Alternative includes construction of a new replacement slip and normal repair and maintenance activities. While not likely, minor disruptions in ferry service could occur during these activities.

#### **Preferred Alternative**

Construction vehicles on local roadways could cause congestion, but this would not markedly affect emergency service response times or access to public service facilities.

Because the Mukilteo Tank Farm is not currently in use and it is located at the end of most of the utility service areas, construction or relocation of utilities is not expected to cause service disruptions to residents or businesses in the project vicinity. Minor service disruptions could occur during construction of intersection improvements proposed at SR 525 and First Street, or for connecting utilities to the new facilities.

## **Existing Site Improvements Alternative**

Construction impacts for the Existing Site Improvements Alternative would be similar to those discussed for the No-Build Alternative.

Construction of the Existing Site Improvements Alternative would have temporary impacts on project site utilities because service disruptions would be needed to connect new facilities to water, sewer, and gas mains.

## **Elliot Point 1 Alternative**

The potential construction impacts of this alternative are similar to those described above for the Preferred Alternative.

### **4.13.5 Indirect and Secondary Impacts**

Few indirect impacts on public services or utilities have been identified. For the No-Build Alternative, ferry operations would continue to operate similarly to present conditions. The Existing Site Improvements Alternative would be similar. For the Preferred Alternative and Elliot Point 1 Alternative, removing the existing ferry terminal features and operations at Front Street could provide the opportunity for redevelopment of the waterfront area. Utility replacements or upgrades may be necessary to serve future development and would be the responsibility of the developer. The Elliot Point alternatives provide the opportunity to reclaim portions of a currently vacant site, and improve the transportation access to the site, which could enable other developments on portions of the site not used for transportation purposes. These developments could also require improvements in utilities or expand areas requiring public services.

### **4.13.6 Cumulative Impacts**

No cumulative impacts on public services or utilities have been identified for any of the alternatives.

### **4.13.7 Mitigation Measures**

#### **Mitigation for Long-Term Impacts**

None of the alternatives involve long-term impacts requiring mitigation.

#### **Mitigation for Construction Impacts**

For all alternatives, impacts on public services would be minimized by preparing an Emergency Response Plan in coordination with emergency responders that addresses construction and operation safety issues and includes response procedures for emergencies.

WSDOT would coordinate with local water, stormwater, and sewer districts regarding potential relocations of utility infrastructure. In the case of off-site interruptions in service, customers would be given advance notice. Where utility relocations are necessary in public rights-of-way, utility objects would be placed outside of applicable control zones—areas WSDOT maintains around roadways to minimize risk of roadwork damaging utility objects. If it is not possible to locate utilities outside of control zones, mitigation measures would be applied in compliance with the WSDOT *Utilities Manual* (May 2013) and in coordination with the City of Mukilteo. Other WSDOT construction BMPs would be maintained throughout construction.

## 4.14 Other Considerations

This section identifies whether any adverse effects could not be mitigated, and it documents any irreversible and irretrievable commitments of resources that would be involved in the Mukilteo Multimodal Project. It also presents information on the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term environmental productivity.

### 4.14.1 Irreversible Decisions and Irretrievable Resources

WSDOT and FTA have expended funds for the planning, design, and environmental review of this project, but similar activities would be required for any course of action regarding the terminal, including the No-Build Alternative. The existing terminal has facilities that will need to be replaced due to their age and condition.

For any of the alternatives, some resources would be irretrievable after completion of project construction. These resources would include the physical materials used to build the project such as aggregate to make concrete and asphalt, steel to make rebar and structures, oil to make asphalt, and earth materials for fill. The energy that would be consumed for construction work, and would therefore be irretrievable, would include fossil fuels to operate construction equipment and to transport materials and workers to the site. Although all of these resources are finite in nature, their supply would be adequate for this project and other needs in the near future.

Some excavated soils not reused on site would be disposed of at landfills, and the space used for these soils would not be available for other wastes. However, there is adequate landfill space available to accommodate all wastes that local communities would dispose of in the foreseeable future.

Energy used during operation of the facility would include electricity needed to keep lights and electrical systems running; fossil fuels to operate the ferries; and, indirectly, fossil fuels for vehicles to drive to the ferry terminal. These activities would occur under the No-Build Alternative and with any of the Build alternatives, although the Build alternatives would be more energy efficient because the new terminal building would be built to LEED silver standards. Project operation is not expected to have a substantial effect on energy consumption, energy sources, or fuel available in the region or the state.

All of the alternatives would involve activities that could disturb archaeological sites, resulting in potential damage to archaeological artifacts. Measures to avoid adverse effects would be included in each alternative.

### **What are the tradeoffs between the short-term uses of environmental resources and long-term gains (or productivity) from the project?**

To consider whether the project's long-term benefits make it worth the short-term disruption and the use of the resources involved in building the project, the EIS considers factors such as duration of project construction and the effects on all elements of the environment from construction. It then weighs these impacts against the project's anticipated benefits.

All alternatives would expend resources to replace the terminal's aging facilities with newer, more seismically stable facilities.

Because of the constraints of the existing site, neither the No-Build Alternative nor the Existing Site Improvements Alternative is able to fully address safety and security needs because the terminal area cannot be fully secured. The location of the existing site in the floodplain presents additional safety and operational problems, especially with climate change likely to worsen storm surges and winter storms. In addition, the No-Build Alternative would expend funds and incur construction impacts to replace a facility in a configuration that continues to pose longer-term problems for operations and safety. This includes poor sight distance for vehicles loading and unloading, constrained transit capacity, and continued pedestrian-vehicle conflicts. The Existing Site Improvements Alternative would include overhead passenger loading, which would improve terminal operation somewhat.

All Build alternatives would expend resources to create new transit facilities, add a signalized intersection at First Street and SR 525, and make other street improvements. These improvements would lead to long-term benefits for multimodal connectivity, transit mobility, vehicle travel, and pedestrian connectivity. These mobility improvements would promote economic growth in downtown Mukilteo.

The Preferred Alternative and Elliot Point 1 Alternative both involve higher levels of construction activities, material use, and site preparation activities compared to the No-Build Alternative or the Existing Site Improvements Alternative. This includes preparation of the Mukilteo Tank Farm for construction, the removal of the existing terminal facility and the Tank Farm Pier, dredging, and the development of the terminal and transit center on an entirely new site. However, while the short-term uses of resources would be greater, the long-term gains or benefits would include improved operations for the ferry terminal, reduced congestion, and improved safety and security. Safety and security benefits cannot be calculated quantitatively, but potential consequences of not providing for an improved facility to meet current seismic standards and national security directives range from severe regional transportation mobility disruption to injury and loss of life. These risks would be present as long as the facility remains unimproved. These alternatives are also expected to provide greater social and economic benefits because they relocate the terminal away from existing waterfront businesses and a major community waterfront park, and they would redevelop a large portion of a vacant brownfield site for beneficial public uses.

The removal of the Tank Farm Pier would also provide an environmental benefit by reducing the extent of over-water structures in the area, and removing thousands of creosote-treated wood piles. All Build alternatives would improve stormwater treatment facilities; the Preferred Alternative and Elliot Point 1 Alternative would treat water from a larger area, producing a greater benefit. Building the terminal on a new site at a higher elevation than the existing terminal could help to minimize impacts of service disruption due to long-term flooding associated with rising sea levels.

All of the alternatives would affect archaeological sites. However, an area developed as part of a federal project triggers certain protections for historic resources that would not apply to private development of the same area. Therefore, the Preferred

Alternative (or any other alternative) for this project would only proceed in consultation with interested tribes and DAHP, and include commitments developed through the Section 106 process to resolve the project's adverse effects on the archaeological sites. The project's Section 4(f) commitments will incorporate the MOA and add an overlapping regulatory protection to the resources on the site. The project's federal approval would also stipulate how the project would protect resources and mitigate for unavoidable impacts. The Preferred Alternative's Section 106 commitments also include designing project elements and features to commemorate the area's significant cultural and historic sites and increase public understanding of their importance.